

# Bulletin Board

## Contents

JUN. 12, 2020

(click on page numbers for links)

### REGULATORY UPDATE

#### ASIA PACIFIC

Update on the transition to GHS Revision 7 .....	4
Amendments to the APVMA MRL Standard .....	4
Asia's plastic-polluted rivers pose a problem for Australia. So scientists are turning to drones.....	5
COVID-19 information for workplaces.....	6

#### AMERICA

NJ finally getting PFOA and PFOS out of drinking water.....	7
49 million tons of feedlot water, plus commercial fertilizer, send polluted runoff to rivers, lakes and drinking water sources .....	8

#### EUROPE

COVID-19: Return to work Europe.....	10
--------------------------------------	----

### REACH UPDATE

Why are safer chemicals so essential to the circular economy? Why do we need more clarity on harmful chemicals in products? .....	19
ECHA's committees support restricting silicone-based substances in consumer and professional products .....	19
Consultation on harmonised classification and labelling .....	20

### JANET'S CORNER

The Original Sun Worshipper .....	21
-----------------------------------	----

### HAZARD ALERT

Ethylbenzene .....	22
--------------------	----

### GOSSIP

Your 2030 electric vehicle is parked on the bottom of the ocean.....	25
In Canada, Inuit communities are shaping research priorities .....	28
Researchers turn organs into stretchy see-through material.....	35
Algorithim tacks down buried treasure among existing compounds.....	36

## CONTACT US

subscribers@chemwatch.  
net  
tel +61 3 9572 4700  
fax +61 3 9572 4777

1227 Glen Huntly Rd  
Glen Huntly  
Victoria 3163 Australia

**\* While Chemwatch has taken all efforts to ensure the accuracy of information in this publication, it is not intended to be comprehensive or to render advice. Websites rendered are subject to change.**

# Bulletin Board

## Contents

JUN. 12, 2020

Shiseido reveals plant extracts strengthen capillaries to maintain skin elasticity.....	38
Uber just destroyed thousands of electric bikes.....	39
Coronavirus seems to reach the brain. What could this mean for us? .....	40
Grey hairs sometimes regain their colour when we feel less stressed.....	45
Winds can carry PFAS pollutions miles away from manufacturing facilities .....	47
Fracking linked to rare birth defect in horses: study .....	48

## CURIOSITIES

Do bike-share programs actually increase bike commuting? Here's what 10 years of data tells us .....	51
Tired of plastic? These businesses have ideas for you.....	51
Is it a farm of a sculpture park? Both .....	55
Cobalt is critical to the renewable energy transition. How can we minimize its social and environmental costs? .....	57
In the walking capitals of the world, drivers still rule the road.....	61
The birds are not on lockdown, and more people are watching them .....	64
From beetles to butterflies, scientists and landowners are working together to bring endangered insects back from the brink.....	67
These bacteria have adapted to life in your nose—and that may be good news .....	70
NASA and SpaceX launch astronauts into new era of private spaceflight.	72
This kind of coal could fuel COVID-19 recovery.....	73

## TECHNICAL NOTES

(Note: Open your Web Browser and click on Heading to link to section) ...	77
CHEMICAL EFFECTS.....	77
ENVIRONMENTAL RESEARCH.....	77
PHARMACEUTICAL/TOXICOLOGY .....	77
OCCUPATIONAL.....	77

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

### ASIA PACIFIC

#### Update on the transition to GHS Revision 7

2020-06-05

We have been working towards adopting the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Revision 7 for workplace hazardous chemicals under the model WHS laws since late 2019.

A two-year transitional period was due to start on 1 July 2020. However, Safe Work Australia Members have agreed to delay the start of the transitional period due to the impact of COVID-19 on Australian businesses.

The new start date for the transitional period is **1 January 2021**. A full two-year transitional period will follow from this date.

To ensure that any importers and manufacturers that had already begun work on implementing GHS 7 are not disadvantaged, state and territory governments will put in place regulatory arrangements allowing businesses to start classifying and labelling chemicals in accordance with GHS 7 from 1 July 2020. Suppliers and end users will also be able to supply and use GHS 7 labelled chemicals under these arrangements. Details of the regulatory arrangements will be published on our website when they become available.

Guidance to support businesses to transition to GHS 7 will also be published on our website soon.

To stay informed about the transition to GHS 7, subscribe to the hazardous chemicals mailing list.

Safe Work Australia, 5 June 2020

<https://www.safeworkaustralia.gov.au/media-centre/news/update-transition-ghs-revision-7>

22 October 2019

#### Amendments to the APVMA MRL Standard

2020-06-01

The Australian Pesticides and Veterinary Medicines Authority (APVMA) approves maximum residue limits (MRLs) of agricultural and veterinary chemicals in agricultural produce, particularly produce entering the food chain. The MRLs approved by the APVMA are associated with a regulatory

**The new start date for the transitional period is 1 January 2021. A full two-year transitional period will follow from this date.**

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

decision to register a product, grant a permit approval, or as an outcome from a review decision and are set out in the Agricultural and Veterinary Chemicals Code (MRL Standard) Instrument 2019. The MRL Standard lists MRLs of substances that may arise from the approved use of agricultural and veterinary chemical products containing those substances on commodities used for human consumption as well as livestock feeds. The MRL Standard also provides the relevant residue definitions to which these MRLs apply. There may be situations where the residue definition for monitoring and enforcement is different to the definition used for dietary risk assessment purposes. MRLs are set at levels which are not likely to be exceeded if the agricultural or veterinary chemicals are used in accordance with approved label instructions. In considering MRLs and variation to MRLs, the APVMA takes into account studies on chemistry, metabolism, analytical methodology, residues, toxicology, good agricultural practice and dietary exposure. In approving MRLs, the APVMA is satisfied, from dietary exposure assessment, that the levels set are not an undue hazard to human health. The APVMA has amended the MRL Standard and the changes will have affect the day after the instrument is registered. Details of the amendment can be found in the Agricultural and Veterinary Chemicals Code (MRL Standard) Amendment Instrument (No. 4) 2020 The amendments will be incorporated into the compilation of the Agricultural and Veterinary Chemicals Code (MRL Standard) Instrument 2019. The MRL Standard is accessible via the Federal Register of Legislation website

APVMA Gazette, 1 June 2020

[https://apvma.gov.au/sites/default/files/gazette\\_02062020.pdf](https://apvma.gov.au/sites/default/files/gazette_02062020.pdf)

### Asia's plastic-polluted rivers pose a problem for Australia. So scientists are turning to drones

2020-06-01

It's one of 10 rivers in the world that collectively contribute up to 95 per cent of plastic in the ocean.

Running for more than 4,000 kilometres, the Mekong River flows through six countries, starting in China and making its way through Myanmar, Laos, Thailand, Cambodia and Vietnam.

It is used by millions of people and is home to a rich ecosystem. But now its pollution problem poses an issue for the region and Australia.

"Plastic pollution that originates along a river like the Mekong, may make its way out to the sea, and ultimately — given winds and waves and

**It is used by millions of people and is home to a rich ecosystem. But now its pollution problem poses an issue for the region and Australia.**

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

currents — that could end up on Australian shores as well," CSIRO principal research scientist Britta Denise Hardesty suggested.

"So whether you care about wildlife, whether you care about tourism or what's in your own backyard, the global nature of this problem means something over the other side of the world could end up in your backyard."

Long before the COVID-19 pandemic hit, scientists were working on a global plastic pollution survey backed by the CSIRO at a number of sites around the world to see how the issue was impacting on river systems.

For months, researchers have been studying plastic pollution at five sites along the Mekong River in South-East Asia, and along the Ganges River in India.

Preliminary results released his week show the Mekong River is suffering the most from plastic bottles and plastic bags being dumped in or nearby the precious waterway.

Yet even with the preliminary data in, scientists concede there could be an even bigger task ahead.

abc.net.au, 1 June 2020

<https://www.abc.net.au/news/2020-05-31/scientists-use-drones-to-find-plastic-in-mekong-river/12038274>

### COVID-19 information for workplaces

2020-06-03

Safe Work Australia has published [new work health and safety guidance for COVID-19](#).

Guidance on managing risks from COVID-19 is now available for:

- [Gyms and fitness centres](#)
- [Beauty salons and day spas](#)
- [Cultural institutions](#)
- [Cinemas](#)

Please note, restrictions have been in place for these industries. Restrictions are being relaxed in different jurisdictions at different times.

**Businesses must only operate to the extent permissible under the public health directions in each state or territory they provide services.**

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

Businesses must only operate to the extent permissible under the [public health directions](#) in each state or territory they provide services.

Certain activities may not be permissible in your state or territory at this time and therefore some of the proposed measures may not be relevant to your workplace.

New information has also been published about [Heating, Ventilation and Air Conditioning \(HVAC\) Systems](#). It includes information on managing risks to health and safety from HVAC systems, for example, when restarting systems that have been temporarily shut down.

For more information and resources, go to the [Safe Work Australia COVID-19 Information for workplaces web page](#)

Safe Work Australia, 3 June 2020

<https://www.safeworkaustralia.gov.au/covid-19-information-workplaces>

## AMERICA

### NJ finally getting PFOA and PFOS out of drinking water

2020-06-01

New Jersey is finally getting two dangerous chemicals linked to serious health problems—including cancer—out of its drinking water. The state [finalized regulations](#) today that set maximum contaminant levels for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) at concentrations that are among the strictest in the nation—a huge milestone for all New Jerseyans.

PFOA and PFOS are two chemicals in a group of problematic chemicals known as [per- and polyfluoroalkyl substances \(PFAS\)](#). PFOA and PFOS have been used widely in consumer and industrial products since the 1940s, including in nonstick cookware (e.g., Teflon), stain-resistant repellents put on carpets and fabric (e.g., Scotchgard and Stainmaster), paper and cardboard food packaging (e.g., fast food wrappers), firefighting foam, water-resistant textiles (e.g., Gore-Tex), and personal care products like dental floss.

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

Unfortunately, PFOA and PFOS are associated with serious health effects such as cancer, hormone disruption, liver and kidney damage, developmental and reproductive harm, changes in cholesterol levels, and immune system toxicity—some of which can occur at extremely low levels of exposure.

Due to their widespread use and the fact that they don't break down and can spread quickly through our environment, PFAS are now detected in the bodies of 99 percent of Americans.

New Jersey is especially hard-hit by PFAS contamination: 1.6 million of the 6 million people exposed to levels of PFOA and PFOS that exceed EPA's lifetime health advisory of 70 parts per trillion (ppt) live in New Jersey—the most of any single state. Elevated levels of PFOA, PFOS, and other PFAS chemicals have been found across New Jersey, including in Atlantic City, Bedminster, Ridgewood, Washington, Gloucester, Elizabeth, and Edison. The map below illustrates total combined PFAS levels in New Jersey water supplies where some testing for PFAS has taken place.

NRDC, 1 June 2020

<https://www.nrdc.org/experts/kimberly-ong/nj-finally-getting-pfoa-and-pfos-out-drinking-water>

### 49 million tons of feedlot water, plus commercial fertilizer, send polluted runoff to rivers, lakes and drinking water sources

2020-05-29

MINNEAPOLIS – Manure from Minnesota's 23,000 animal feedlots threatens to overload nearby cropland with chemicals that can pollute lakes, streams and aquifers, including drinking water sources, a new Environmental Working Group investigation **found**.

Using innovative geospatial techniques, EWG mapped where the 49 million tons of manure produced each year by the state's cattle, hogs, turkeys and chickens are likely applied to cropland as fertilizer – which is frequently on the same acreage where commercial fertilizer is also used.

“For the first time, we can clearly see the extent to which farmers are overloading land in Minnesota's farm country with animal manure and fertilizer – and where the problem is the worst,” said Sarah Porter, senior GIS analyst with EWG and co-author of the report. “This new tool

**“This new tool illuminates why water quality across the state is declining at an alarming rate.”**

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

illuminates why water quality across the state is declining at an alarming rate.”

When nitrogen and phosphorus, found in both manure and fertilizer, are applied in excess of what plants can take in, the chemicals can run off cropland, polluting surface waters and groundwater aquifers. Most Minnesotans get their tap water from groundwater supplies.

The Minnesota Pollution Control Agency, or MPCA, estimates that 56 percent of all of the state’s surface bodies of water do not meet basic water quality standards, and that so-called non-point source pollution, like runoff from cropland and animal operations, is responsible for about 85 percent of water pollution.

But water pollution does not stop above ground: Many of Minnesota’s animal operations are located in the central and southeast parts of the state, which also have the worst nitrate contamination of groundwater.

Although medium-sized and large feedlots account for less than one-fourth of the total animal feeding operations in Minnesota, they produce almost three-fourths of the state’s manure. (The number of animals that defines a medium or large operation varies by type of animal.) Manure can be an effective fertilizer for crops but is expensive to transport, so it is usually applied to fields close to the feedlot where it is generated – leading to a glut in areas with higher concentrations of medium and large feedlots.

“Our simulation shows that, even if manure is the only fertilizer used, some areas are fully saturated. This leaves little room to adapt to natural variations in weather, crop needs or the chemical content of different types of manure,” Porter said. “But we are still seeing high levels of commercial fertilizer sales in these same areas, so many acres may be getting as much as a double dose of nitrates and phosphorus, which simply can’t be absorbed.”

Minnesota now has three times as many large feedlots as in 1991, primarily due to new swine facilities. About three-quarters of all the state’s large feedlots house swine.

EWG’s new investigation found that in 69 of Minnesota’s 72 agricultural counties, nitrogen from manure combined with nitrogen in fertilizer exceeded the recommendations of the MPCA and the University of Minnesota.

Perhaps unsurprisingly, Minnesota’s tap water supplies are showing the effects of these overapplications of nitrogen.

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

In January, EWG released **a study** revealing that an estimated 500,000 Minnesotans drink tap water contaminated with elevated levels of nitrate, a breakdown product of nitrogen. Nitrate in drinking water is associated with an increased risk of colorectal cancer, birth defects and other serious health problems.

In February, **another EWG report** showed that the problem has worsened in more than 60 percent of the Minnesota tap water systems with the highest levels of nitrate contamination – many of them in the same areas that have high concentrations of feedlots.

EWG’s new simulation also found that on 57 percent of the fields likely to receive manure, phosphorus was applied in excess of crop needs. Phosphorus pollution is the primary driver of toxic algae outbreaks in lakes, rivers and other waterways, which can sicken both people and animals. EWG maintains **a map** illustrating that such outbreaks are increasingly common across the state.

The coronavirus pandemic has raised serious questions about the reliability and safety of the industrial model of meat production. Working conditions inside meatpacking plants spread the virus among workers and **surrounding communities**. Livestock producers are pushed to the brink as prices collapse, and consumers fear meat shortages.

EWG’s new analysis reveals yet another troubling vulnerability: The relentless growth and concentration of livestock operations is overwhelming the capacity of the land to handle the 49 million tons of manure that goes on surrounding fields every year, threatening drinking water, Minnesota’s iconic lakes and streams and the quality of life of residents.

EWG, 29 May 2020

<https://www.ewg.org/release/ewg-investigation-manure-overload-threatens-water-minn-farm-country>

## EUROPE

### COVID-19: Return to work Europe

2020-06-01

The COVID-19 emergency led the Member States of the European Union to adopt appropriate preventive measures aimed at achieving a healthy and safe resumption of work activities and avoiding the spread of the

**This article includes the French, German, Italian and United Kingdom perspective.**

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

virus at the workplace. This article includes the French, German, Italian and United Kingdom perspective.

France

The gradual end of the lockdown in France started as of 11 May 2020.

Different documents have been published by the French government to assist companies organize the return to work:

- on 28 April 2020, the French Prime Minister presented to the Parliament the *“National plan for the end of the lockdown”* (Plan) providing a general framework that may be adapted by each department;
- on 3 May 2020, the French Labor Ministry published a *“National protocol regarding the end of the lockdown for companies to ensure health and safety of the employees”* (Protocol), specifying the measures to be applied within companies;
- on 7 May 2020, the French Prime Minister disclosed a map showing “red” and “green” departments: “red” for departments where the number of contamination cases remains very high and for which strict measures still apply and “green” for the departments with a lower contamination rate for which the resumption to normal life will be less restrictive.

The documents published by the French government, as well as the recommendations available on the sites of the various ministries, encourage a gradual return to work on the company’s premises in order to avoid any risk of contamination, but maintaining remote work remains the recommended option.

Consequently, it is essential for companies to assess as soon as possible the necessary arrangements of the works organization for a gradual and safe return to work. It is necessary to establish an operational diagnosis in order to determine:

- which employees / services are physically needed within the premises of the company,
- or, on the contrary, which employees should continue to work remotely in light of their personal situations (e.g: presence of a sick person in the home, children who do not return to school, the constraint of public transport, etc.).

Return to work directly affects the employer’s safety and security obligation towards employees. The company and its legal representatives

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

are criminally liable for this obligation. Therefore, if an employer fails to comply with its obligation to provide sufficient and appropriate protective measures for employees to carry out their duties in a safe manner (i.e., soap, hydro-alcoholic gels, masks, minimum safety distance, barriers between employees etc.) , employees could trigger the company’s liability or exercise their right of withdrawal (droit de retrait).

In the Protocol, the French Labor Ministry reiterates the main rules of risk prevention:

- eliminate or reduce the contamination risk, in particular by promoting remote work whenever possible;
- give priority to collective prevention measures (i.e., shift rotation, change in break times, circulation organisation, protective glazing, spacing of workstations, disinfectant cleaning if the premises have been used in the last 5 days, etc.);
- alternatively, provide for individual prevention measures (masks, soap, hydro-alcoholic gel, etc.).
- update the document for the assessment of risks (“Document Unique d’Évaluation des Risques”), act in collaboration with the employees’ representative institution (“CSE”) and inform the employees.

From a practical standpoint, barrier measures are essential, and additional clarifications were provided by the Government:

- use of gloves is not recommended,
- a space of 4 square meters per person in the same space must be insured; failing this, the wearing of “general public” masks must be mandatory;
- occupancy plans must be drawn up, and companies are being invited to provide information on peak periods via digital tools (applications, website, mailing, etc.)

In addition, according to the Protocol (which, however, is a government recommendation and not a legal mandate), screening tests at the entrance to the company’s premises are not authorised (several groups had announced that they would provide screening tests for their employees). The Protocol also states that systematic monitoring of employee temperatures is not recommended. However, if the employer wishes to set up a temperature control at the entrance of the company, it must (i) post an information note for the employees (ii) provide employees with sufficient guarantees (i.e., prior information in particular regarding the maximum temperature allowed in the premises and the consequences of

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

a positive control, compliance with the General Data Protection Regulation regarding personal information, etc.).

For implementation of the new work organization and safety measures within the company, employers should consider involving the CSE, the labor doctor and the employees. In particular, the labor doctor and the CSE may also assist the employer in establishing specific procedures for the care of symptomatic employees in order to, (i) train the labor health services, (ii) isolate the symptomatic employee, (iii) identify the persons in contact with the employee, and (iv) organise the employee's return to home or the takeover by emergency services.

### Germany

The German Federal Ministry of Labor issued specific Covid-19 workplace health and safety standards employers should take into account when employees return to work (official English version available [here](#)). While the standards are not directly applicable law, they need to be considered when determining "necessary measures" required for the protection of employees under applicable health and safety laws. Non-compliance with the standards currently would not immediately result in fines. However, non-compliance could result in employers being held liable, especially towards employees based on a breach of their general duty of care.

The standards include preventive measures going beyond common workplace health and safety measures. As a general principle, employers shall sufficiently inform employees with regard to infection prevention as well as other health and safety measures at the workplace. Further, they shall ensure that employees comply with general hygienic precautions. Furthermore, the standards include various specific technical, organizational and personnel prevention measures such as:

- Ensuring sufficient distancing (at least 1.5 meters) and implementing alternative safety measures (such as transparent walls) where required. Where distancing is not possible, protective facial masks should be provided and used.
- Extending hygienic measures (such as provision of soap and towel dispensers, frequent cleaning of sanitary rooms and common areas, including doorknobs and handrails).
- Office work to be carried out from home where possible. Business travel and meetings to be reduced to a minimum and replaced by technical alternatives where possible.

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

- Limitation of access to the business premises by externals and documentation of any such access where possible.
- Use of working materials (including vehicles) on a personalized basis only where possible. Regular cleaning, especially prior to any required use of materials by other employees.
- Reduction of occupancy density at work and common areas by implementing staggered work and break times, shift work, etc. In the case of shift work, the employees working at the same time should stay the same where possible.

The employer should further implement internal rules for a quick response to suspected infections. Where symptoms arise, a contactless temperature scan should be provided. Employees with symptoms (fever, cough, shortness of breath) should be requested to stay at home up until clarification of the suspicion by a doctor. The employer should also have a pandemic plan covering the scenario of a confirmed infection and information of persons that were in contact with the infected person (e.g. employees and/or customers).

If a works council exists, mandatory co-determination rights may be triggered when implementing specific measures. Further, employers should involve the occupational safety specialist and the company doctor or set up a pandemic management team.

Finally, strict data privacy laws in Germany need to be considered. Asking employees specific health related questions or administering broad obligatory health checks such as temperature scanning, saliva tests, or similar will generally not be possible due to data privacy laws. However, employers should ask employees to immediately disclose Covid-19 related symptoms as well as contacts with other potentially infected persons in order to react to any such disclosures.

### Italy

In order to manage the return to work in during the Covid-19 emergency, Italian companies are required to adopt a set of precautionary measures by (i) a Protocol executed by and between the trade unions, the Government and the associations of employers (the Protocol), recently amended on 24 April 2020, and by (ii) a Note issued the same date by the Italian Institute for Insurance Against Accidents Occurred At Work (the "Note" and along with the Protocol jointly referred to as the "Regulations").

The Regulations require employers to take the following steps:

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

- Involve the Company Doctor in the evaluation of all the necessary measures to be adopted, including medical check-ups of employees.
- Update the Risk Assessment Document (*Documento Valutazione Risci* - the RAD) with the assistance of the Company Doctor, so that each and any risk connected with biological agents is duly detected.
- Properly inform and instruct employees about the new biologic agent-related risk, the hygienic-sanitary behaviours to be followed and the official communications issued by the Competent Public Bodies.
- Adopt new individual protection devices, such as single-use gloves, certified masks, and hand-washing hydro-alcoholic measures.
- Ensure both the day-to-day cleaning and the periodical sanitization of the premises, rooms, workplaces, common areas and working tools. Where possible, a distance of at least 1 meter between individuals shall also be guaranteed.
- Adopt anti-infection security protocols and draft a specific emergency plan in case of risk of dissemination of the virus. An *ad hoc* committee should also be established along with works councils and the safety representative for employees, which committee should periodically meet to evaluate whether the health and safety measures adopted from time to time are fit for their intended purposes.
- Use temperature scanners to measure the employees' body temperature, in compliance with the privacy legislation currently in force. If the body temperature exceeds 37.5°, the employer should prevent the employee from entering the workplace. Clinical tests to be conducted on employees seem viable too. However, they can be conducted and co-ordinated only by the Company Doctor under the terms and conditions provided by the Italian Labour law and Data Protection law.
- Implement an ad hoc reorganisation plan in agreement with the works council. In this regard, the Employer should: (i) redefine all the production levels; (ii) ensure a rotation plan of the employees in order to limit physical contacts as much as possible and create independent and separate groups; (iii) prioritize the use of smart working for all working activities which can be carried out remotely and grant the employees holidays and permits to leave; (iv) re-organize workspaces to ensure the minimum social distance between employees, in accordance with the business requirements; (v) promote and sponsor the use of private vehicles or shuttles, in order to reduce the risk that the employees are infected when commuting through public transport; (vi) suspend and cancel all national and international

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

- business travels and missions; and (vii) limit as much as possible the employees' movements within the company's premises and limit their access into common spaces.
- Identify specific procedures for entrance, transit and exit of suppliers in order to limit their access into the premises and contacts with the company's personnel. In addition, where employees of third-party companies/contractors operate in the same productive unit (e.g. maintenance technicians, suppliers, cleaners or security guards), the company shall provide its contractors/third-party companies with its own security guidelines and make sure that the third-party companies'/contractors' employees fully comply therewith.
- In the event of personnel's flu-like symptoms, the employer shall adopt specific measures in order to isolate the employee and all the other employees working in the company's premises. Specifically, if an employee is tested positive to COVID-19, the company (a) shall promptly inform the health authorities, (b) shall sanitize the company's premises and (c) may ask all the employees who had "close contacts" with the infected one to leave the company's premises. An employee tested positive to COVID-19 may be enabled to return to work only upon proper certification issued by the competent health authority.

As a general rule, the Employer is primarily responsible for health and safety in the workplace. Should the employer fail to adopt all the safety measures provided for by law and the Regulations, it may be held liable both under a criminal and an administrative perspective and may be sued by such employees who became infected at work for compensation for damages. In addition, business and operations may be suspended until the proper health and safety conditions are duly restored.

### United Kingdom

On 11 May 2020, the UK Government published guidance for employers to help them manage employees returning to the workplace and for workplaces to operate safely.

The guidance is comprised of 8 separate guidance notes. Each note covers a different workplace setting which is allowed to be open, subject to certain conditions. These workplace settings are:

1. Construction and other outdoor work;
2. Factories, plants and warehouses;
3. Labs and research facilities;
4. Offices and contact centres;

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

5. Other people's homes;
6. Restaurants offering takeaway or delivery;
7. Shops and branches; and
8. Vehicles.

Specific guidance has been published for each of the above workplaces but, in general, the guidance focuses on five key principles:

9. *Work from home, if you can:* Employers should take reasonable steps to help employees work from home where possible. However, employees who cannot work from home and whose workplace has not been told to close should go to work. Employers should consider who is essential to be on-site and plan for the minimum number of people needed to operate their business safely and effectively.
10. *Carry out a COVID-19 risk assessment:* Employers have a duty to consult with their workers or trade unions to establish what safety guidelines to put in place. Where employees are returning to the workplace, the UK Government expect all businesses with over 50 employees to publish the results of their risk assessment on their website.
11. *Maintain two metres social distancing, wherever possible:* Employers should re-design workspaces to maintain 2m distances between people. Possible solutions include staggering start times, creating one way walk-throughs, opening more entrances and exits, or changing seating layouts in break rooms, canteens and common areas.
12. *Where people cannot be two metres apart, employers must manage transmission risk:* Employers should look into putting barriers in shared spaces, creating workplace shift patterns or fixed teams minimising the number of people in contact with one another, or ensuring colleagues face away from each other.
13. *Reinforcing cleaning processes:* Workplaces should be cleaned more frequently, paying close attention to high-contact objects like door handles and keyboards. Employers should provide handwashing facilities or hand sanitisers at entry and exit points.

Each workplace specific guidance note covers the following areas in more detail:

- *Risk* - including risk management and risk assessments;
- *Who should go to work* - including people at higher-risk and equality in the workplace;
- *Social-distancing* - including travel to and from work, workstations, meetings and common areas;

# Bulletin Board

## Regulatory Update

JUN. 12, 2020

- *Managing customers, visitors and contractors* - including explaining available guidance;
- *Cleaning the workplace* - including before reopening, cleaning and personal hygiene;
- *Personal Protective Equipment (PPE)* - including face coverings;
- *Workforce management* - including shift patterns, travel, communication and training; and
- *Inbound and outbound goods* - including prevention of surface transmission.

At the heart of the UK Government's guidance is the safety of employees and the need to control the spread of COVID-19. The UK Government has acknowledged that "unless people feel safe, employees won't return, customers will stay away and the restart will falter, harming livelihoods and public services".

The key theme that emerges from the guidance is that employers bear a legal responsibility to protect their workers and others from risk to their health and safety. Employers are encouraged to have open and proactive dialogue with their workforce in order to agree to safe return to work policies and procedures.

The UK Government expects this guidance to evolve over time and has committed to setting up taskforces to work with sectors currently closed (such as bars and restaurants) to develop safe ways for them to open at the earliest point at which it is safe to do so. We are closely monitoring the situation for any developments.

The National Law Review, 1 June 2020

<https://www.natlawreview.com/article/covid-19-return-to-work-europe>

# Bulletin Board

## REACH Update

JUN. 12, 2020

### Why are safer chemicals so essential to the circular economy? Why do we need more clarity on harmful chemicals in products?

2020-06-01

The EU Green Deal aims to create a sustainable society with a competitive and innovative economy. This cannot be done without changing the chemicals we produce and the way we produce, use and reuse them.

Our online event focuses on three main topics:

- Safer chemicals for a greener Europe
- Tracking substances of concern
- Harmonised information for poison centres

Start the day with an outlook on how EU chemicals policies are contributing to a more sustainable society.

Practical advice, demos and company case studies on reporting to European poison centres and to the new SCIP database on substances of concern in products will help you meet the new obligations on harmful chemicals in 2021.

The full content of the event will be available on Tuesday, 2 June 2020 at 9:00 Helsinki time. It will remain available online after the event.

ECHA, 1 June 2020

<https://echa.europa.eu/-/join-us-online-to-discuss-safer-chemicals>

### ECHA's committees support restricting silicone-based substances in consumer and professional products

2020-06-03

The consolidated opinion of the Committees for Risk Assessment and Socio-Economic Analysis supporting ECHA's proposal to restrict the use of the cyclosiloxanes D4, D5 and D6 is now available.

The proposal aims to restrict the placing on the market of products containing these substances in concentrations of more than 0.1 % weight-by-weight and could lead to a 90 % reduction in overall emissions to the environment. Cosmetics are the main source of releases of D4, D5 and D6.

# Bulletin Board

## REACH Update

JUN. 12, 2020

The opinion has now been sent to the European Commission for decision making, and they will have three months to produce a draft amendment to the list of restrictions.

ECHA, 3 June 2020

[https://echa.europa.eu/view-article/-/journal\\_content/title/echa-weekly-3-june-2020](https://echa.europa.eu/view-article/-/journal_content/title/echa-weekly-3-june-2020)

### Consultation on harmonised classification and labelling

2020-06-03

ECHA is looking for comments on the harmonised classification and labelling proposals for diuron (ISO); 3-(3,4-dichlorophenyl)-1,1-dimethylurea (EC 206-354-4, CAS 330-54-1). The deadline for comments is 31 July 2020.

### New proposals and intentions to harmonise classification and labelling

Two new intentions to harmonise classification and labelling have been received for:

- benthialdicarb isopropyl (EC 605-799-5, CAS 177406-68-7); and
- 5-chloro-2-methyl-2H-isothiazol-3-one (EC 247-500-7, CAS 26172-55-4).

Three proposals have been submitted for:

- 9-[2-(ethoxycarbonyl)phenyl]-3,6-bis(ethylamino)-2,7-dimethylxanthylum chloride (EC 213-584-9, CAS 989-38-8);
- hydrogen sulphide (EC 231-977-3, CAS 7783-06-4); and
- picolinafen (ISO); N-(4-fluorophenyl)-6-[3-(trifluoromethyl)phenoxy]pyridine-2-carboxamide; 4-fluoro-6-[( $\alpha,\alpha,\alpha$ -trifluoro-m-tolyl)oxy]picolinanilide (EC 604-030-0, CAS 137641-05-5).

ECHA, 3 June 2020

[https://echa.europa.eu/view-article/-/journal\\_content/title/echa-weekly-3-june-2020](https://echa.europa.eu/view-article/-/journal_content/title/echa-weekly-3-june-2020)

**The deadline for comments is 31 July 2020.**

## Bulletin Board

## Janet's Corner

JUN. 12, 2020

## The Original Sun Worshipper

2020-06-15



<http://uneearthedcomics.com/comics/sun-worshipper/>

## Bulletin Board

## Hazard Alert

JUN. 12, 2020

## Ethylbenzene

2020-05-15

Ethylbenzene (also: Ethyl Benzene) is a colourless, flammable liquid. Its molecular formula is  $C_8H_{10}$  or  $C_6H_5C_2H_5$ , and its CAS number is 100-41-4. It has a strong petrol-like odour and it is insoluble in water. The compound is found naturally in products such as petrol and coal tar—and is also produced on an industrial scale for inks, paints and insecticides. [1,2]

## USES [1,2]

Ethylbenzene is used in multiple areas, including in the manufacturing and construction industries. It is mainly used in the manufacture of styrene—a precursor to polystyrene—and other co-polymers. The compound is also used as a solvent in paints, carpet glue, inks, varnishes and pesticides. Ethylbenzene is used in petrol and coal tar processing facilities, as well as a constituent of asphalt.

## ROUTES OF EXPOSURE [1,3]

- The primary route of occupational exposure is via inhalation.
- Indoor levels of the compound tend to be higher than ambient levels due to the presence of household products, such as paints.
- Consumer products—such as tobacco smoke, gasoline, varnishes and solvents can result in increased level of exposure to ethylbenzene.

## HEALTH EFFECTS

Methylbenzene poisoning can affect a range of systems including the nervous, respiratory and integumentary systems.

## Acute Effects [1,3]

Severity of symptoms depend on the level and type of exposure.

- Acute effects of ethylbenzene poisoning include irritations of the nose, throat, eyes and skin. It can also result in chest tightness, dizziness and headaches.
- Animal studies on the liquid have reported Central Nervous System (CNS) toxicity.

**Ethylbenzene (also: Ethyl Benzene) is a colourless, flammable liquid.**

# Bulletin Board

## Hazard Alert

JUN. 12, 2020

### Chronic Effects [1,3]

Ethylbenzene is toxic to multiple body systems. Long-term effects of ethylbenzene poisoning could result in liver and kidney damage and blood toxicity. Animal studies have also shown that chronic effects of ethylbenzene poisoning could include irreversible damage to the inner ear.

### SAFETY

#### First Aid Measures [4]

- Inhalation: If someone has inhaled ethylbenzene, move them to a fresh air source (if safe to do so). Contact a medical professional.
- Skin contact: Remove affected clothing if safe to do so. Rinse skin with soap and lots of water. Call a doctor or poison centre.
- Ingestion: DO NOT INDUCE VOMITING. Rinse out the victim's mouth with water. Immediately contact a medical professional.
- Eye contact: Gently flush the victim's eyes with water. Contact a doctor.

#### Exposure Controls/Personal Protection [4]

- Engineering controls: Safety showers and emergency eyewash fountains should be accessible in the immediate area of the potential exposure. ENSURE THERE IS ADEQUATE VENTILATION. Whenever possible, material should be handled in a laboratory.
- Personal protection: Safety glasses, protective and dustproof clothing, gloves, an apron and an appropriate mask/respirator.

### REGULATION [5]

#### United States:

The Occupational Safety and Health Administration has set the permissible exposure limit (PEL) for ethylbenzene at 100ppm, and a short-term exposure limit (STEL) of 125ppm.

#### Australia [1]

Safe Work Australia: Safe Work Australia has set an 8-hour time weighted average (TWA) for ethylbenzene of 110ppm. Safe Work Australia has set the STEL at a limit of 125ppm.

# Bulletin Board

## Hazard Alert

JUN. 12, 2020

### REFERENCES

1. [https://www.safeworkaustralia.gov.au/system/files/documents/2002/health\\_monitoring\\_guidance\\_-\\_ethyl\\_benzene.pdf](https://www.safeworkaustralia.gov.au/system/files/documents/2002/health_monitoring_guidance_-_ethyl_benzene.pdf)
2. <https://pubchem.ncbi.nlm.nih.gov/compound/ethylbenzene>
3. <https://www.epa.gov/sites/production/files/2016-09/documents/ethylbenzene.pdf>
4. [https://www.cdhfinechemical.com/images/product/msds/37\\_446411061\\_EthylBenzene-CASNO-100-41-4-MSDS.pdf](https://www.cdhfinechemical.com/images/product/msds/37_446411061_EthylBenzene-CASNO-100-41-4-MSDS.pdf)
5. <https://www.cdc.gov/niosh/npg/npgd0264.html>

# Bulletin Board

## Gossip

JUN. 12, 2020

### Your 2030 electric vehicle is parked on the bottom of the ocean

2020-05-28

Materials required for the emerging global electric vehicle industry can be found in abundance on the bottom of the Pacific Ocean, about halfway between Hawaii and Mexico.

In a region called the Clarion-Clipperton Zone (CCZ), on the seafloor at depths between 4 and 5.5 kilometers, an estimated 21 billion metric tons of “polymetallic nodules” wait to be picked up by mining robots.

The nodules have been estimated to contain 6 billion tons of manganese, 270 million tons of nickel, 230 million tons of copper and 50 million tons of cobalt. These materials are needed to make batteries for electric vehicles (EVs), electrical cables and other equipment critical to the move from a fossil-fueled to a clean-tech world.

“Measured according to their dry mass, the nodules are typically made up of about 31% manganese, 7% iron, 1.4% nickel, 1.2% copper, and 0.17% cobalt,” says Carsten Rühlemann, the director of the marine geology and deep-sea mining section of Germany’s Federal Institute for Geosciences and Natural Resources (BGR).

“The nodules’ composition happens to be remarkably well-aligned with the needs of electric vehicle makers,” Gerard Barron, CEO of Vancouver Canada-based DeepGreen Metals (DGM), told DW. “Carmakers will need a great deal more of these metals in order to make battery cathodes and electrical connectors for an electric vehicle fleet of around a billion cars and trucks by mid-century, up from just 5 million today.”

DeepGreen Metals’ mission is not limited to harvesting nodules, Barron says. The long-term goal is to ensure that the metals are fully recycled, with nothing thrown away: “First we have to mine enough of these metals to supply the huge increase in quantity we’ll need for a renewable-energy-powered e-mobility future. Then we need to make sure we recycle everything.”

#### Land mining vs. seabed harvesting

Barron and Rühlemann both say there are good reasons to believe the environmental impact of seabed nodule mining will be far less severe than land-based mining in terms of greenhouse gas emissions, solid waste and toxic materials release.

# Bulletin Board

## Gossip

JUN. 12, 2020

Accessing land-based ores requires clearing a lot of land, moving a lot of overburden, and crushing huge volumes of rock, Barron notes. Land-based ores are also dirtier as they contain more toxic heavy metals. And while CCZ seafloor nodules contain four metals key to the EV industry in one handy package, three different land-based mines are needed to obtain those same four metals.

A comparative life cycle assessment (LCA) commissioned by Barron’s DGM and titled “Where should metals for the green transition come from?” was published in April 2020. The LCA results show a clear win for seafloor nodules.

While burning fossil fuels puts 37 billion tons of CO<sub>2</sub> waste into Earth’s atmosphere every year, land-based metal production generates over 350 billion tons of waste — some of it toxic.

Calling metal mining the cause of “the biggest waste problem on the planet,” the report notes: “If we produce metals for the green transition the way we’ve been producing them so far, we will in effect be shifting the environmental and social burden from fossil fuels to metals.”

In contrast to land-based mining of the same metals, collecting and smelting the nodules will generate essentially no solid waste, no mine tailings, no toxic waste, no clearing of forests, about 70% less greenhouse gas emissions, 90% less freshwater use, and 90% less sulfur and nitrous oxide emissions.

#### Before seafloor nodule mining can begin

There are two hurdles yet to be crossed before seafloor nodule mining can begin. One is technological: Commercial nodule harvesting machines capable of operating at the crushing pressures 5 kilometers (3.1 miles) below the ocean’s surface don’t exist yet. Engineers are working on it, Rühlemann and Barron say.

The other is regulatory: An interim assessment of the impact on biodiversity and ecosystem functioning is among the steps left to complete before the International Seabed Authority (ISA) finalizes its Mining Code and allows mining to go ahead, likely within the next two or three years. The CCZ is in international waters, so the area is subject to governance by the ISA, which was established under the UN Convention on the Law of the Sea (UNCLOS) in 1994.

The one impact that seabed mining will have that land-based mining doesn’t have is disturbance of seabed ecosystems. Skimming the surface

**The nodules have been estimated to contain 6 billion tons of manganese, 270 million tons of nickel, 230 million tons of copper and 50 million tons of cobalt.**

## Bulletin Board

## Gossip

JUN. 12, 2020

of the seabed to harvest nodules, and pumping the nodules up to mining ships, will disturb the seafloor mud and nodule habitat of benthic marine organisms, many of which are species of marine worms.

It will also generate plumes of silt from the mud pumped up with the nodules, most of which will quickly settle back down over wide areas of ocean floor, but some of which may remain in the water column for long periods of time, affecting pelagic organisms such as fish communities.

Things happen slowly in the cold, dark ocean depths. BGR's Rühlemann told DW that available research suggests that in benthic areas scarred by mining, recovery of the microbial community, which is the base of the benthic food web, occurs after about five decades. A spokesman for DeepGreen Metals cites other research that says it could recover within three decades. For comparison, some research indicates that soil microbe recovery remains incomplete four decades after terrestrial mining.

It is unknown, as yet, whether some benthic species exist exclusively within the CCZ region. To minimize the risk that nodules harvesting will cause biodiversity losses, the ISA has set aside nine large areas within the CCZ as protected areas, known as Areas of Particular Environmental Interest (APEIs). Two or three additional 160,000-square-kilometer (61,000 square-mile) APEIs are likely to be added soon.

Contractors are expected to allocate between 10%-30% of their contract areas as "no-take zones," offering further habitat protection.

**By the numbers**

The area of the CCZ is about 4.5 million square kilometers in size. For comparison, that's slightly larger than the total land area of the European Union's 27 member states. The area ISA has licensed for nodule mining exploration so far is just 1.2 million square kilometers — a small fraction (0.7%) of the total area of the Pacific Ocean seafloor, which is 165 million square kilometers.

According to Rühlemann, about 80% of the licensed areas will be left undisturbed from direct collector impact, with only the most economically viable 20% likely to be harvested.

"So far, the ISA has issued 16 license areas of about 75,000 square kilometers each to companies or agencies they knew have the technical resources to carry out the work to explore the area — one of which was my employer, BGR," Rühlemann explains.

## Bulletin Board

## Gossip

JUN. 12, 2020

To obtain a license, an applicant must first preexplore an area of 150,000 square kilometers. Once the preliminary prospection was complete, the ISA split each of these areas into two 75,000 square-kilometer units of roughly equal value, with the exploration rights for one staying with the ISA, which may assign these so-called reserved areas to developing countries, and the other staying with the exploration company.

Working from the American research ship Kilo Moana, chartered from the University of Hawaii or from the German research vessel Sonne, Rühlemann and his BGR research team have spent about 40 days sailing the Pacific every summer since 2006, taking samples in the German license area.

"About 20% of the area is of especially high commercial value, because of high nodule densities and flat seafloor topography. We've studied 4,000 square kilometers of these economically valuable areas intensively."

Referencing a 2019 report to the ISA by the MIT Materials Systems Laboratory, Rühlemann estimates that initial investment costs for a CCZ nodule mining ship and smelting operation within a single license area will be between €1.5 and €2 billion. Annual operating costs should be in the range of €200-€400 million per year, about two-thirds of which will be the costs of smelting the nodules on land, with the ship-based mining operation comprising the rest.

The overall total potential of the CCZ nodule fields, then, if all 16 current license holders each were operating one mining ship simultaneously, would be on the order of 32 million dry tons of nodule ore a year. Adding more ships per license area would, of course, speed things up.

The optimal number of harvesting operations will depend on global market demand and ore prices. Rühlemann guesses that it's likely that only 3 to 5 mining ships will operate simultaneously over the CCZ.

[dw.com](https://www.dw.com), 28 May 2020

<https://www.dw.com>

**In Canada, Inuit communities are shaping research priorities**

2020-05-27

TEN YEARS AGO, the 1,200 residents of the tiny, mostly Inuit village of Nain, in Canada's far northeast, lived through a natural disaster unnoticed by most of the world. From January to March, the average temperature —

**From January to March, the average temperature — typically in the low single digits Fahrenheit — hovered well over 10 degrees above normal.**

## Bulletin Board

## Gossip

JUN. 12, 2020

typically in the low single digits Fahrenheit — hovered well over 10 degrees above normal. What little sea ice formed was thin, cracked, and pockmarked with open patches. Hunting became risky or impossible, food supplies ran low, and a community survey found that one in 12 ice travelers suffered accidents that year. That spring, at least one person drowned when their snowmobiles plunged through weak ice.

Ice travel has never been risk-free, and for centuries Inuit have relied on traditional trails and time-tested knowledge for mitigating risk — paying attention to ice's color, texture, or the resistance it offers a sharp blow with a harpoon. But 2010 was different. "That year was so extreme and impacted people so clearly," said Robert Way, a climatologist of Inuit heritage at Canada's Queen's University. "There was a terrible sense of loss and anxiety about what it meant for the future."

That year was also, however, a year of celebration: the fifth anniversary of the creation of Nunatsiavut (pronounced noo-nut-see-ah-voot), a self-governing Inuit territory with Nain serving as the administrative capital. Meaning "Our Beautiful Land" in Inuktitut, Nunatsiavut is today the only ethnic Inuit government in Canada. (The territory of Nunavut, though majority Inuit, uses a non-ethnic public government model.)

In 2010, that fledgling government had few resources to handle an existential climate threat, but it did have plenty of scientists and researchers traipsing through its immense backyard, studying everything from permafrost to prehistoric glaciation. In the past, little of their work felt directly relevant to locals. "Researchers would come through, do their work, not tell anyone what they were doing, and then leave without having any beneficial impact on the community," said Carla Pamak, the Nunatsiavut government's Inuit Research Adviser, who lives in Nain.

So that June, with the disastrous winter fresh in mind, the government hosted the Tukisinnik Community Research Forum, bringing together locals and a handful of academics whom the community already trusted. The idea was to re-orient research toward local priorities — sea ice high among them. The meeting "really set the agenda for the next five to 10 years," said Trevor Bell, a participant and geography professor with Memorial University in St. John's, Newfoundland and Labrador. "Out of it came an understanding that research is something the community can control for its own benefit."

Bell's own claim to fame is SmartICE. Created in collaboration with the Nunatsiavut government, SmartICE integrates traditional ice knowledge with real-time data gathered from sensors embedded in and pulled across

## Bulletin Board

## Gossip

JUN. 12, 2020

sea ice. Piloted in Nain beginning in 2012, SmartICE aims to generate a reliable map of travel hazards, accessible by desktop or smartphone.

SmartICE isn't alone. Over the past decade, the Nunatsiavut government has redirected outside researchers' efforts toward Inuit priorities, including mental health, marine pollution in wild foods, housing shortages, and, of course, sea ice. In doing so, Nunatsiavut has been an early contributor to the change now spreading across Canada's four Inuit regions, which altogether encompass more than 1.4 million square miles, from the Alaskan border to the Atlantic. The consequences could transform the conduct of Canadian and international researchers in the north — a part of the world that holds vital clues about the future of a warming planet, but where the legacy of science-as-usual remains shadowed by centuries of mistrust, anger, and exploitation.

INDIGENOUS COMMUNITIES around the globe, including Inuit in Canada, have a long and fraught relationship with science and academia. As long ago as the 1880s, Inuit were frequently featured as anthropological oddities in traveling Victorian expositions; and as recently as the 1970s, according to an ongoing lawsuit, Canadian university researchers used Inuit as human test subjects, performing skin grafts, measuring pain reactions, and forcing them to stand underdressed in frigid weather to test cold tolerance.

Especially among older generations, this legacy has created wariness of researchers and institutions from what Inuit call "the south": typically, southern Canada, but also the United States, Europe, or just about anywhere else. Not helping matters is a history of often brutal Canadian colonial policies. These included the mass killing of sled dogs from the 1950s to '70s, and the forced separation of children from parents into residential schools. Inuit dress, language, and customs were forbidden at these schools, the last of which closed in 1996. Inuit today suffer a litany of well-documented social ills, including addiction, poverty, and some of the world's highest suicide rates. These conditions have been scientifically linked to cultural breakdown resulting from decades of colonialism.

Against this backdrop, science-as-usual can remain a source of tension and mistrust. Trevor Bell has worked in Canada's north since the 1980s, when he was studying prehistoric climate change. Back then, he said, he was doing the same things Indigenous people disliked: "landing in airports and jumping on helicopters to remote locations, not really interacting with the community, not reporting why we were there."

## Bulletin Board

## Gossip

JUN. 12, 2020

That tension remains, even as a wave of Inuit political activism has started producing serious structural change in Canadian politics. Six years before Nunatsiavut formed, the majority-Inuit territory of Nunavut was created in Canada's high Arctic, and Canada's other two Inuit regions are today moving toward limited self-government. All four regions come together as Inuit Tapiriit Kanatami, a group that represents Canadian Inuit interests federally. In 2018, ITK launched the National Inuit Strategy on Research (NISR), aiming to elevate research self-determination and give Inuit communities greater say in the research that takes place in their homeland.

"The academic community often thinks of itself as enlightened, or very progressive," said the group's president, Natan Obed, who is originally from Nain. "And we as Inuit are walking into this room, crowded with non-Inuit, and saying, 'Sorry, but you're actually behind.'" In Obed's view, the constitutional and political transformation in Canada that has enabled governments such as Nunatsiavut has advanced more quickly — with more profound implications for Inuit society — than have changes to the scientific status quo.

One of the organization's chief complaints focuses on research funding and decision-making. Most research conducted in Inuit regions occurs with little or no input from Inuit, who are rarely represented on government or university granting bodies. As a result, scientists' research priorities have skewed heavily to biological and physical sciences, rather than to the social sciences — a bias that is likely to persist now that the region is generally regarded as a window into our collective global future. In 2014, a report from the National Academies of Sciences, Engineering, and Medicine stated that "what happens in the Arctic has far-reaching implications around the world." The region holds a significant amount of the world's fish and oil reserves, while melting snow and ice exacerbates climate change and contributes to rising sea levels.

Critical as they are, these facts are often far from top-of-mind for Inuit. "Walk into any community, any hamlet office, and ask to look in the filing cabinet," said Bell. "They don't have a file that says 'climate change'. They have a file that says 'unemployment', 'poverty', 'homelessness', 'suicide.' We know that climate change probably negatively impacts all of those issues. But it's hard to talk to someone about climate change when they're hungry."

THAT REVELATION IS what led to SmartICE, which since 2013 has gone through four generations of massive, stationary ice-thickness sensors —

## Bulletin Board

## Gossip

JUN. 12, 2020

called SmartBUOYS — deployed in sea ice at locations determined by local and traditional knowledge. The system is complemented by SmartQamutiks — named for a traditional Inuit sled — which use electromagnetic currents to discern ice thickness. The data are uploaded to a website, available as color-coded ice-thickness tracks and a buoy time series.

The idea is to address a whole basket of community issues. Safer travel, after all, helps hunters access food, improves mental health, and helps get less-experienced travelers on the ice, enhancing traditional cultural knowledge among youth.

The project hasn't been without hiccups. Most significantly, in 2016, the funding for pilot-testing the more advanced SmartBUOYS and SmartQamutiks moved from Nain to Pond Inlet, Nunavut, 1,200 miles to the northwest. This created some hard feelings in Nain, some locals say. But this year has seen the most widespread deployment yet, with the program now operating in 17 communities across the Canadian north, including Nain.

SmartICE owes much of its success to the Nunatsiavut Research Center, one of only three Inuit-owned research facilities in northern Canada. Housed in a plain, two-story office building next door to Nain's only hotel and restaurant, the center consists of two small labs, a kitchenette and common area, workstations, offices, and overnight accommodations. In large part, its success has gone hand-in-hand with Nunatsiavut's political autonomy. Pamak said that many of the goals put forth in the National Inuit Strategy on Research have already been met in Nunatsiavut. "And a lot of what has happened here," she said, "has sparked the national strategy."

As Inuit Research Adviser, Pamak co-chairs Nunatsiavut's research advisory committee, which meets monthly to assess research applications, evaluating their objectives, their value to the region, and how results will be communicated to locals. If a project runs afoul of the committee's guidelines, the advisory committee works with the principal investigator to find a solution — which usually succeeds.

SmartICE isn't the only fruit of this collaboration, nor the only ice-related project. McGill University associate professor Bruno Tremblay studies sea-ice mechanics. He travels regularly to Nain to learn the effects of tides and wind on ice anchored to the shore or the ocean floor — called landfast ice — which acts as a seasonal extension of the coastline. As with SmartICE, his research involves deploying buoys to develop more accurate

## Bulletin Board

## Gossip

JUN. 12, 2020

predictive models of sea-ice coverage. In order to work in Nunatsiavut, he shares data freely with community members, and tends to place buoys where the community requests. "There will always be interesting science questions no matter where we deploy," said Tremblay, "so we try to go with their priorities."

Tremblay and other researchers work regularly with Joey Angnatok, a 43-year-old Inuit hunter, fisherman, handyman, search-and-rescue worker, and part-time citizen scientist. Angnatok helps non-locals glean at least a little of what the icebound world means to Inuit. To a southerner, the landscape appears beautiful but bleak, a labyrinth of frozen mountains and bays. Angnatok brings it down to a human scale, pointing out stories and myths about particular islands or bodies of water, describing which areas were historically occupied by which families, and identifying the most extraordinary landforms, such as PiKalujak ("Iceberg") Island, a nearly vertical face of bare rock that rises dramatically from the frozen waters of Nain Bay.

As a search-and-rescue volunteer, Angnatok knows intimately the dangers inherent to ice travel. He was instrumental to SmartICE's pilot phase, working with Bell and other collaborators to help them get the lay of the land, deploying and checking on buoys, and hauling SmartQamutiks.

"I've always been sort of a science geek," Angnatok said. "I'd talk to elders and they'd say, 'Oh I've never seen a hole there in the ice before, I wonder what's going on?' And then you talk to researchers and they'd be able to talk about water salinity and other observations, and you begin to see how it works together."

THE QUESTION OF how science and Inuit knowledge can complement and enhance one another is key to another effort, in the community of Pond Inlet, where SmartICE launched its second major pilot. Here, a program called Ikaarvik ("bridge," in Inuktitut) fosters collaboration between Inuit youth and outside researchers. (One of the program's partners has been SmartICE, which used Pond Inlet as its second major pilot site after Nain.)

"Young Inuit are often feeling pulled in two directions," said Eric Solomon, director of Arctic Programs at the nonprofit Ocean Wise, which administers Ikaarvik. Elders want the youth to uphold traditional values, he said, even as the world rapidly changes around them.

Solomon recalls an afternoon he spent several years ago, with an Inuit elder, in a town about 155 miles north of the Arctic Circle. The two men were out on the ice, and in the quiet of the moment, Solomon asked the

## Bulletin Board

## Gossip

JUN. 12, 2020

older man about the changes he'd seen in his lifetime, and what they'd meant to him. The man sat quietly for a moment, before describing how he had always been able to navigate by the wind, the sky, and the condition of the ice. He had learned these skills from his parents and grandparents and now it was his turn to give this knowledge to the next generation. But the pace of change in his lifetime had undermined much of its usefulness.

"He believed," said Solomon, "that his role in his society had become obsolete."

This kind of story, said Solomon, can change researchers' perspectives on the urgency of marrying research concerns to community needs. But for all the promising endeavors — and the attention and celebration that has greeted marquee projects like SmartICE — such efforts remain exceptions. One problem, he believes, is the traditional scholarly funding model, which requires clear-cut research questions to be identified before work gets underway. This means researchers are unable to travel to remote communities to inform their research proposals, so communities can't meaningfully be involved in determining questions or methodology.

Even SmartICE hasn't been a perfect model of cross-cultural collaboration. In 2016, the program won Canada's Arctic Inspiration Prize, given annually to research and scientific teams working on projects of tangible benefit to northern communities. The prize was worth \$400,000. With that and the following year's United Nations Momentum for Climate Change Solutions award, SmartICE has transitioned into a "social enterprise" aimed not just at mitigating travel risk, but creating jobs and economic opportunities in the north, said SmartICE executive director Carolann Harding. Around this time, the program's pilot testing moved to Pond Inlet, Nunavut. Some locals say the transition wasn't well communicated to people in Nain, making SmartICE not exactly the model of research self-determination that Bell and its creators intended it to be.

Meanwhile, ice accidents persist: in 2015, Nain resident Jim Andersen was riding his snowmobile near Nain Bay when a vehicle in front of him suddenly dropped into thin ice. Anderson pulled the two passengers from the water and they survived. They were lucky; several years earlier, two people died in a similar snowmobile incident.

The first months of 2020, however, have seen new optimism. SmartICE recently set up the Nain Production Centre, a small facility where local youth are assembling the most advanced iteration of the SmartBUOY, to be distributed to communities throughout the north. And Nain deployed

## Bulletin Board

## Gossip

JUN. 12, 2020

its first 4.0 buoy in early February. They had to wait until it was safe to go out to deploy it, Harding said — the ice was late to form again this year.

undark.org, 27 May 2020

<https://www.undark.org>

### Researchers turn organs into stretchy see-through material

2020-05-21

Seeing inside someone's heart. Stretching the mind. These aren't just turns of phrase but something that researchers can physically do with help from polymer science and microscopy. Massachusetts Institute of Technology chemical engineer Kwanghun Chung has found a way to turn organs into flexible, transparent hydrogels (*Nat. Methods* 2020, DOI: [10.1038/s41592-020-0823-y](https://doi.org/10.1038/s41592-020-0823-y)).

When he was a postdoc, Chung helped develop a way to render brain tissue transparent and fixed in polyacrylamide, but the resulting samples were brittle. Chung and his team have now adjusted the amounts of acrylamide, cross-linker, and initiator to create an entangled hydrogel rather than a cross-linked one. Because the long polymer chains are entangled, the links can slip around one another, giving the gel structural integrity but also flexibility and stretchability. The team call the technique ELAST (entangled link-augmented stretchable tissue-hydrogel).

When their polymer formulation infuses biological tissues, cells and molecules become entangled in a stretchy gel. That makes fragile tissues easier to handle and can speed up the process of fluorescently labeling cells or biomolecules. Instead of waiting for imaging probes to diffuse through a thick sample, they can stretch out ELASTicized samples and apply a solution of fluorescent probes, maximizing the contact between the labels and the samples and speeding up the labeling process. When the gel snaps back to its original shape, it's ready for imaging and the next round of labeling. Chung hopes to use the technique to make a comprehensive map of the human brain.

cen.acs.org, 21 May 2020

<https://www.cen.acs.org>

**The team call the technique ELAST (entangled link-augmented stretchable tissue-hydrogel).**

## Bulletin Board

## Gossip

JUN. 12, 2020

### Algorithm tacks down buried treasure among existing compounds

2020-05-28

A machine-learning algorithm has been developed by scientists in Japan to breathe new life into old molecules. Called BoundLess Objective-free eXploration, or BloX, it allows researchers to search chemical databases for molecules with the right properties to see them repurposed. The team demonstrated the power of their technique by finding molecules that could work in solar cells from a database designed for drug discovery.

Chemical repurposing involves taking a molecule or material and finding an entirely new use for it. Suitable molecules for chemical repurposing tend to stand apart from the larger group when considering one property against another. These materials are said to be out-of-trend and can display previously undiscovered yet exceptional characteristics.

'In public databases there are a lot of molecules, but each molecule's properties are mostly unknown. These molecules have been synthesised for a particular purpose, for example drug development, so unrelated properties were not measured,' explains Koji Tsuda of the Riken Centre for Advanced Intelligence and who led the development of BloX. 'There are a lot of hidden treasures in databases.'

#### Drop the boundaries

However, out-of-trend materials are challenging to discover using existing methods. 'Machine learning for materials discovery requires the underlying data to cover a large area of the desired property space, while existing chemical knowledge tends to rely on well-known materials,' says James Cumby whose work at the University of Edinburgh, UK, explores functional materials using database mining and quantum chemistry.

How current machine learning discovery routes work is another logjam to finding out-of-trend materials. Some require an appropriate optimisation target in advance. Other techniques can be more random but only probe a set property space. This creates boundaries that the methods cannot search beyond.

'In most studies about machine learning-based optimisation of materials, one needs to determine an objective function in advance,' explains Tsuda, noting that a prime example would be binding affinity to a protein. To overcome this boundary and objective function limitation, Tsuda's team conceived a way to parse molecules based on relative novelty.

**Chemical repurposing involves taking a molecule or material and finding an entirely new use for it.**

## Bulletin Board

## Gossip

JUN. 12, 2020

'The Blox method addresses one of the drawbacks of other commonly-used exploration algorithms targeting the chemical landscape: their reliance on human-inputted boundary conditions,' comments [Clemence Corminboeuf](#) who researches machine learning and computational chemistry at the Swiss Federal Institute of Technology in Lausanne (EPFL).

The Blox workflow includes a mathematical technique known as Stein discrepancy, described as 'refreshingly unconventional' by [Ganna Gryn'ova](#), a computational chemist at Heidelberg University in Germany. The process begins by selecting materials randomly from a database and observing their properties by experiment or simulation. A machine learning prediction model is then applied to determine these properties more rapidly over a larger dataset and the materials are arranged by plotting one desired property against another. At this point, the Stein discrepancy comes into play and makes Blox so good at finding out-of-trend molecules.

'To find a novel molecule, it is necessary to define a distance between a molecule at hand and the set of molecules in the database,' explains Tsuda. The Stein discrepancy highlights molecules that are distant from the main grouping of the database, when plotted in property space. A greater distance means that one of the properties is likely to be unusual and the molecule out-of-trend.

Once an out-of-trend candidate is found it can then be assessed with experiments or simulations to confirm if it is truly an out-of-trend material and therefore suitable for chemical repurposing.

**Solar gain**

To show the utility of Blox, the team used it to probe 100,000 molecules from the [Zinc database](#) – a public database that researchers typically screen for bioactive compounds. Only this time, they were looking for molecules with a high degree of photoactivity. Blox was instructed to map the property space as the absorption wavelength for the first singlet excited state against oscillator strength. From this search, eight out-of-trend molecules that could be used in applications such as solar cells were found and their properties confirmed using density functional theory. 'This is an enticing tool for exploring properties beyond common trends that will hopefully find its way to other chemical and materials science communities where out-of-trend systems are in demand,' says Gryn'ova. Corminboeuf also says that Blox holds great promise, and that it would be 'especially appealing for the design and discovery of materials, for which

## Bulletin Board

## Gossip

JUN. 12, 2020

the final efficiency depends on multiple independent conditions, for example hole transport materials.'

chemistryworld.com, 28 May 2020

<https://www.chemistryworld.com>

**Shiseido reveals plant extracts strengthen capillaries to maintain skin elasticity**

2020-05-28

Shiseido Company, Limited has gained understanding of the mechanism in which capillaries contribute to skin elasticity, and identified that neem leaf extract and Houttuynia cordata extract work effectively for maintaining thick (large diameter) and stable capillaries, which can become thinner and regress due to aging and ultraviolet rays.

**Studies to Understand the Mechanism****Softness Sensor Controls the Thickness of Capillaries**

The previous studies conducted by Shiseido have revealed that maintaining healthy capillaries is important for skin elasticity, therefore the company conducted an ongoing investigation of the mechanism that makes capillaries thicker and stronger to revive skin's resilience.

In this study, the researchers discovered that APJ which is a molecule expressed in capillaries, acts as a "softness sensor" that senses elasticity of the surrounding skin area and controls the thickness of the capillaries.

In an experiment using skin models with various elasticity levels, it was confirmed that an adequate elasticity environment upregulated APJ expression and induced thicker capillaries. On the other hand, in a low elasticity environment, APJ expression level was decreased and unstable thin capillaries were induced. Therefore, Shiseido researchers experimentally increased the APJ expression level, and as a result, succeeded in inducing thicker capillaries even in skin model with low elasticity.

**VE-cadherin Strengthens Blood Vessels in Capillaries**

In the downstream of APJ, which senses elasticity and leads to thick capillaries, a molecule called VE-cadherin strengthens blood vessels by promoting the adhesion between vascular endothelial cells.

**In an experiment using skin models with various elasticity levels, it was confirmed that an adequate elasticity environment upregulated APJ expression and induced thicker capillaries.**

# Bulletin Board

## Gossip

JUN. 12, 2020

In this study, it was revealed that capillaries with low VE-cadherin level become thinner and regressed. In the experiment using skin models, it was found that skin elasticity was reduced under the condition with decreased VE-cadherin in capillaries. The company believes that maintaining thick and strong capillaries can improve skin elasticity, leading to the creation of resilient skin.

### **Aging and UV Rays Reduce Skin Elasticity**

Aging and UV-induced damage are one of the factors to reduce skin elasticity and the expression of softness sensor APJ, and it is known that both the factors also cause the VE-cadherin dysfunction.

The researchers conducted a screening of ingredients that strengthen capillaries and found out that neem leaf extract increased APJ expression, and Houttuynia cordata extract promoted VE-cadherin production. The action of these ingredients can be expected to create thick and strong capillaries, and to revive skin resilience from the inside.

Shiseido will pursue the development of new skincare products that prevent skin troubles caused by decrease of skin elasticity, such as wrinkles and sagging, and create resilient skin through utilizing these findings and providing care for capillaries.

cosmetics.specialchem.com, 28 May 2020

<https://www.cosmetics.specialchem.com>

### **Uber just destroyed thousands of electric bikes**

2020-05-27

Two years ago, Uber acquired the bike-sharing startup Jump for a reported \$200 million. Three weeks ago, it offloaded the business to Lime, another micromobility company, as part of a deal that also involved laying off most of Jump's staff. Some of Jump's electric bikes went to Lime—but nearly 20,000 others are now being unceremoniously scrapped.

A new series of videos shared on Twitter shows truckloads of the bikes at a recycling yard, where recyclers are now removing the electric batteries and tires and then recycling the metal. Entrepreneur Cris Moffitt, who shared the videos after receiving them from a friend who works at the recycling company, asks the obvious question: Why weren't these bikes donated, so they could be used instead of wasted?

# Bulletin Board

## Gossip

JUN. 12, 2020

"As part of our recent deal, Lime took possession of tens of thousands of new model Jump bikes and scooters," an Uber spokesperson said in a statement. "We explored donating the remaining, older-model bikes, but given many significant issues—including maintenance, liability, safety concerns, and a lack of consumer-grade charging equipment—we decided the best approach was to responsibly recycle them. It's our understanding that Lime has already begun deploying many of the bikes and scooters they've acquired from us, and will continue to do so in other markets."

Lime didn't respond to a question about why it chose not to buy the older-model electric bikes. But could they have been donated? There would certainly have been logistical challenges, though none are insurmountable: Lime now owns the IP for unlocking and operating the bikes, which might have made operating them solo more complicated. They were designed specifically for use in bike-sharing, which means they require special equipment to charge and so would have required modification for home uses. And while the battery could be removed, the size and weight of the bike means that it's difficult to ride without electric assistance (the bikes are also sized for adults, so they can't be donated to children).

It's an ironic end for the technology that was designed with sustainability in mind—and at an ironic time. Jump launched with a goal to get people out of cars and make cities more sustainable and equitable. Now, at a time when demand for bikes has rapidly grown because of the pandemic, and when many people who are struggling financially could make use of donated bikes, functioning bikes are being dismantled. It's a reminder of one critical piece of sustainable design—it isn't just about making a product from the right materials, or designing for durability or saving energy, but making sure that if a product outlives its first use, it can be reused and not destroyed.

fastcompany.com, 27 May 2020

<https://www.fastcompany.com>

### **Coronavirus seems to reach the brain. What could this mean for us?**

2020-05-27

JENNIFER FRONTERA has been treating people in intensive care for years. But she has never experienced anything like covid-19 before.

**And it is the possible impact of the coronavirus on our brains that is worrying her.**

## Bulletin Board

## Gossip

JUN. 12, 2020

“These patients are absolutely among the sickest any of us have ever encountered,” says the New York-based doctor. But the strange thing is, Frontera isn’t a lung disease specialist or a virologist, she is a neurologist. And it is the possible impact of the coronavirus on our brains that is worrying her.

It was early in the outbreak in New York that Frontera and her colleagues began to notice neurological symptoms in those with [covid-19](#). People were passing out before they were hospitalised. Once in hospital, some of them started having unusual movements. Some had seizures and others had strokes.

Similar reports are coming in from hospitals around the world. Some neurological symptoms appear to be mild, such as the loss of smell and taste. At the other end of the spectrum, a few people have developed encephalitis – a potentially fatal inflammation of the brain.

It is a surprising discovery in a disease that was generally considered to attack the airways, and one of pressing concern. One big question is how the new coronavirus is causing these kinds of symptoms. Growing evidence suggests that the virus may work its way into the brain, directly attacking neurons. If that is the case, we may need to reconsider some of the treatments being developed for covid-19. And we must also prepare for potential long-term and chronic neurological conditions in some survivors.

Millions of people globally have now been infected with the new coronavirus, SARS-CoV-2, but we are still learning [how it works](#). What we do know is that it can be spread by droplets from an infected person and seems to latch on to [receptors on cells in people’s airways](#).

That might be the end of the story for the many infected people who experience either mild symptoms or none at all. [But some will get very sick](#), showing flu-like symptoms that can progress to a severe pneumonia that leaves them struggling to breathe.

The official [symptoms listed by the World Health Organization \(WHO\)](#) initially included fever, tiredness, dry cough, sore throat, shortness of breath, aches and pains and, sometimes, a runny nose or nausea or diarrhoea. But in response to growing reports of people losing their sense of taste and smell, the WHO and US Centers for Disease Control and Prevention have [expanded their lists of symptoms to include](#) the loss of these senses. [A study of 214 people hospitalised with the virus in China](#)

## Bulletin Board

## Gossip

JUN. 12, 2020

has found that 5.6 per cent had a temporary loss of taste, while 5.1 per cent had a temporary [loss of smell](#).

Reports from Europe suggest that these symptoms may be more common. [A survey of 417 people](#) treated at 12 hospitals across Belgium, France, Spain and Italy found that around 86 per cent experienced some change in their ability to smell, and 89 per cent had a “reduced or distorted” ability to taste flavours.

Other neurological symptoms are also showing up. Some people with covid-19 experience headaches and dizziness. Those with more severe illness can suffer seizures and strokes – even young people with no underlying conditions. Such outcomes are thought to be rare, although we don’t have exact numbers. An assessment of 214 people hospitalised with covid-19 in China found that around 6 per cent of those with severe disease developed a condition that affected blood supply to the brain. “We’ve seen strokes and bleeds in the brain,” says Frontera, who is based at NYU Langone Hospital – Brooklyn. There have also been a handful of reports of [brain inflammation](#) and [brain damage](#) in people with severe cases of covid-19.

In some diseases, neurological damage is a knock-on effect of other problems within the body, not caused by the pathogen attacking the nervous system directly. But in this case, it is also possible that the virus could be working its way into the brain and nervous system. Plenty of other viruses that infect humans do this, including coronaviruses.

Pierre Talbot at the National Institute of Scientific Research in Quebec, Canada, has been studying coronaviruses since the 1980s. Much of his work has focused on two [coronaviruses that are known to infect humans](#): HCoV-OC43 and HCoV-229E. Both often cause the common cold.

**Finding a way in**

We know that both can enter the nervous system and brain. “When I put [OC43] in the nose of mice, the virus goes straight to the brain through the olfactory nerve,” says Talbot. “And when it gets to the brain, it spreads to all areas of the brain.” Here, the virus can kill neurons and cause encephalitis.

Similar effects have been observed, but very rarely, in people infected with OC43. Talbot points to the case of an 11-month-old boy with a weak immune system who died with encephalitis. A biopsy revealed [OC43 in his brain](#), implicating the virus.

## Bulletin Board

## Gossip

JUN. 12, 2020

When Talbot and his colleagues looked for 229E and OC43 in brain tissue from 90 people who donated their bodies to science, they found at least one of the two coronaviruses, and sometimes both, in almost half of the samples. Forty-four per cent of them had 229E in their brains and 23 per cent had OC43.

The SARS virus, another coronavirus similar to SARS-CoV-2, seems to act in similar ways. The first SARS outbreak took place between 2002 and 2003, claiming about 8000 lives. Like the coronavirus that causes covid-19, the SARS virus also causes lung disease and can lead to fatal pneumonia in about 10 per cent of those infected. But autopsies performed after the outbreak ended revealed that the virus could get into the brain. In 2005, a team looked at eight people who died with SARS and found the virus in all their brains.

And when researchers infected mice with SARS via their noses, they later found the virus in the animals' brainstems. The brainstem sits between the brain and spinal cord and regulates our breathing. "You can imagine that could further worsen the respiratory failure of these patients," says Igor Koralnik at Northwestern University Feinberg School of Medicine in Chicago, who studies diseases that infect the central nervous system.

What about the new coronavirus? A few reports claim to have found the virus in the cerebrospinal fluid of people with covid-19, which suggests it is getting into the brain and nervous system, says Avindra Nath at the US National Institute of Neurological Disorders and Stroke.

But there is a chance that the virus could get into a sample of this fluid without affecting the brain. If the virus is in a person's blood, this might contaminate the sample taken during a spinal tap, for example.

It is also possible that neurological symptoms may be caused by a lack of oxygen. People who die with covid-19 have a lot of damage to their lungs. The surfaces of small air sacs become thickened, making it harder for oxygen to get into the blood, says Sanjay Mukhopadhyay at Cleveland Clinic in Ohio.

This may also explain why those who survive covid-19 after being treated on a ventilator can show signs of brain damage in scans, says Frontera. This damage is probably a result of the brain being starved of oxygen.

The body's own immune response to an infection could also be to blame for damage to the brain. An overreaction of the immune system can lead

## Bulletin Board

## Gossip

JUN. 12, 2020

to what is known as a cytokine storm – an extreme activation of immune cells that can lead to more inflammation, and damage organs.

But based on the evidence we have so far, it is reasonable to assume the virus is getting into the brain, says Nath. If that is true, it is vital we learn how the virus is attacking the brain. "It will make a huge difference [to how we treat patients]," he says.

At the moment, many antiviral treatments being developed for covid-19 will focus on getting the medication to the lungs. Getting drugs to the brain is an entirely different challenge. For a start, any treatments will have to cross the blood-brain barrier – a protective layer in the brain that controls what can get in. Most drugs can't do this. "It would be a totally different treatment approach," says Nath.

"Based on the evidence we have, it looks as if the virus is entering the brain"

If the virus is accessing the brain, it could have long-term neurological consequences. We know that some viruses can hide in neurons, reactivating to cause disease later in life. Herpes simplex viruses, for example, typically cause cold sores or genital blisters. But in some people, they can trigger inflammation of the brain. Once a person has been infected, the virus lays low in their neurons and can reactivate throughout life.

"It's not impossible that [the coronavirus] could have the same kind of persistence in the brain," says Talbot. "We have seen OC43 and 229E in the brains of humans, and the virus seems to be hiding there – it's possible that upon reactivation they could cause neurological disease."

Some neurological effects are likely to have a lasting impact on people who recover from covid-19. Strokes and seizures can cause brain damage with long-term consequences, for example, and many of those who experience such outcomes will need follow-up care and rehabilitation.

The virus could also cause longer lasting secondary problems. Some might be in the form of post-viral fatigue syndromes.

There is also concern about Guillain-Barré syndrome, which is characterised by poorly functioning peripheral nerves. "It's like an ascending paralysis," says Nath. "It starts with the feet and goes up." Some cases are temporary, but other people experience lasting disability and it can even be fatal.

## Bulletin Board

## Gossip

JUN. 12, 2020

There is growing evidence that Guillain-Barré can develop in some people who recover from covid-19. So far, there have been reports of this in several countries. For example, across three hospitals in northern Italy, over a three-week period in March, doctors noted five cases of Guillain-Barré out of between 1000 and 1200 people treated for covid-19. "That's very significant. About a thousand times more than what you'd expect in the population [in the absence of covid-19]," says Korálnik. "We're probably going to see many more such cases."

It isn't clear who is at risk of developing neurological symptoms or secondary disorders. But what is clear is that many people who are hospitalised with covid-19 and then recover will need to be followed up by healthcare providers, possibly for years.

Some of Frontera's ventilated patients are already showing signs of severe brain damage. "The possibility of them waking up seems extremely low," she says. The prospects for less severely affected people are still unclear. "We're still learning about covid," she says. "It will take a few months before we have a good idea of the prognosis."

Apart from a temporary loss of smell and taste, most of the neurological effects seem to only occur in very severe cases of covid-19. Although we don't yet have exact figures, it seems that only a very small fraction of people experience damage to their brain and nervous system. But it is possible that, for some people, brain effects will be lasting, says Nath. "Brain diseases can really affect who we are – they can change our personality, can affect the way we walk and move and cause all kinds of long-term consequences," he says. "Even if it's only in a small percentage of individuals, the devastation can be quite phenomenal. We should not take it lightly."

newscientist.com, 27 May 2020

<https://www.newscientist.com>

### Grey hairs sometimes regain their colour when we feel less stressed

2020-05-29

People's grey hairs sometimes naturally regain their original colour, typically when individuals feel less stressed. The finding suggests it may be possible to develop drugs to reverse greying.

## Bulletin Board

## Gossip

JUN. 12, 2020

Lab mice go grey when stressed and the same thing seems to occur in people. It has long been assumed that once hairs turn grey, they stay that way. But Martin Picard at Columbia University in New York and his colleagues discovered by chance that hair greying sometimes naturally reverses.

The researchers looked at the hair of 14 healthy men and women from different ethnic backgrounds with an average age of 35. They plucked 397 hairs from the participants and studied them under a microscope. They identified hairs that were turning grey by looking for those that were grey at the roots while still coloured at the tips, as new hair grows from the scalp.

To their surprise, the researchers discovered some hairs showed the opposite pattern – they were coloured at the roots and grey at the tips – suggesting they were reverting from grey to their original colour.

Because hair grows at a fixed rate of 1 to 1.3 centimetres per month, the team was able to trace these colour transitions back to specific life events.

The reversals tended to correlate with periods of reduced stress. For example, it occurred in one participant when he went on a two-week holiday and in another after she recovered from the stress of her marriage breakdown.

It is feasible that stress reductions could trigger a reversal of hair greying, says David Fisher at Harvard University. However, it probably only occurs in a few scattered hairs, since we would have noticed if people's full heads of grey hair changed colour when they felt less stressed, he says. "Most instances of hair greying do not seem to be reversible, but perhaps there is a discreet subset of grey hairs that can do this."

If we can uncover the biological mechanisms underpinning reverse greying in these few hairs, we may be able to develop drugs that stimulate anti-greying across all hairs, says Fisher. "I think it's theoretically possible," he says. We already know that certain cancer drugs seem to stimulate reverse hair greying in a small number of patients, he notes.

One intriguing possibility is that, if grey hair is reversible, ageing in the rest of the body may also be partially reversible, says David Sinclair at Harvard University. It would be interesting to test whether other parts of the body show similar signs of reverse ageing during periods of reduced stress, he

## Bulletin Board

## Gossip

JUN. 12, 2020

says. "It's definitely worth looking into, now that we have tools to measure biological age accurately," he says.

newscientist.com, 29 May 2020

<https://www.newscientist.com>

### Winds can carry PFAS pollutions miles away from manufacturing facilities

2020-05-28

Winds can carry PFAS pollution several miles away from manufacturing facilities, according to a new study.

Per- and polyfluoroalkyl substances, or PFAS, are a class of synthetic compounds used in a variety of industrial processes and found in dozens of household items. Previous studies have linked the toxins with a variety of health problems, including cancer and high cholesterol.

Surveys have revealed elevated levels of PFAS in water systems and sources in towns and cities all over the United States. And while manufacturers have phased out PFAS, research suggests the compounds synthesized as replacements are also harmful.

To get a better sense of how PFAS make their way into the environment, researchers at Ohio State University and the Environmental Protection Agency collected and analyzed dozens of water samples collected at sites surrounding a fluoropolymer production facility in Parkersburg, West Virginia. "We took water samples from surface waters at different distances in the predominant direction downwind from the manufacturing facility," researcher Linda Weavers, professor of earth sciences at Ohio State University, told UPI in an email. "The concentrations revealed an exponential decrease with distance, consistent with what we would expect from PFAS contamination due to wind transport of PFAS air emissions at the facility."

However, the results -- published this week in the journal *Environmental Science Technology* -- revealed elevated PFAS concentrations several miles from the manufacturing facility.

"Seeing that these compounds are measured much farther from the manufacturing facility than identified previously, it improves our understanding of which communities may be impacted by these compounds," Weavers said. In 2013, the facility stopped using a common PFAS compound called perfluorooctanoic acid, PFOA, swapping it out for

## Bulletin Board

## Gossip

JUN. 12, 2020

hexafluoropropylene oxide dimer acid, HFPO-DA, the toxicity of which hasn't been well-studied. Researchers found small concentrations of both PFAS and HFPO-DA at sites as far as 30 miles from the manufacturing facility.

"The presence of high levels of PFOA in surface waters years after it was phased out of use at the facility indicates it sticks around and continues to be a source of contamination for a very long time," Weavers said.

In followup studies, Weavers and her research partners plan to test for the presence of PFAS in the air.

upi.com, 28 May 2020

<https://www.upi.com>

### Fracking linked to rare birth defect in horses: study

2020-05-29

A new study has uncovered a link between fracking chemicals in farm water and a rare birth defect in horses—which researchers say could serve as a warning about fracking and human infant health.

The study, published this month in the journal *Science of the Total Environment*, complements a growing body of research linking fracking to numerous human health effects, including preterm births and high-risk pregnancies. This is believed to be the first study to find fracking chemicals in farm water linked to birth defects in farm animals.

In 2014, veterinarians at the Cornell University Hospital for Animals in Ithaca, New York, realized that they'd diagnosed five out of 10 foals born on one farm in Pennsylvania with the same rare birth defect. The birth defect, dysphagia, involves difficulty swallowing caused by abnormalities in the throat. Dysphagia causes nursing foals to inhale milk instead of swallowing it, which often results in pneumonia if milk gets into their lungs.

"We'd hear a gurgling sound when the foals nursed, and we confirmed they were dysphagic by using video endoscopy to look for milk in their tracheas, instead of in their esophagus where it should be," Kathleen Mullen, a veterinarian and the study's lead author, told EHN. "We treated them by passing a feeding tube so they could eat, and if there was pneumonia from the aspiration, we treated that with antibiotics. The foals generally recovered with time, but some never nursed again."

**In 2014, veterinarians at the Cornell University Hospital for Animals in Ithaca, New York, realized that they'd diagnosed five out of 10 foals born on one farm in Pennsylvania with the same rare birth defect.**

## Bulletin Board

## Gossip

JUN. 12, 2020

The birth defect is so rare that the rate among the general population isn't known, but one paper on health outcomes in horses from a large university veterinary neonatal intensive care unit documented just five cases of dysphagia out of 1065 hospitalized foals—a rate of less than 0.5 percent.

The owner of the Pennsylvania farm the horses came from also owned a farm in New York. Both farms used the same commercial horse feed and sourced hay from the same place—but none of the horses born on the New York farm ever had dysphagia. Additionally, several mares that lived on the Pennsylvania farm for the first half of their gestation had healthy foals after being moved to the New York farm mid-pregnancy, while several mares who started out in New York and were moved to Pennsylvania mid-pregnancy had dysphagic foals.

The only difference the farmer identified was that in Pennsylvania, there were 28 fracking wells within seven miles of the farm—two of which were within 1,500 feet of the property's two water wells. There were no fracking wells near the New York farm. The state banned the practice in 2015 following a seven-year review of its health and environmental impacts, during which time there was a moratorium on it.

"We realized this was a really rich study opportunity," Mullen said, "so we decided to look more closely to see if environmental factors were associated with the dysphagia cluster."

Over the next two years, Mullen and colleagues analyzed samples of feed, soil, air, and water, and samples of blood and tissue samples from mares and foals at both farms. During that time, 65 foals were born, 17 of which were dysphagic—all of them from the Pennsylvania farm.

They didn't find significant differences in the feed, soil, air, or blood and tissue samples from the two farms. But they did find a significant difference in the water: There were higher levels of four kinds of polycyclic aromatic hydrocarbons (PAHs)—chemicals commonly used in fracking—in the water at the Pennsylvania farm that weren't seen in water at the New York farm. Those chemicals included fluoranthene, pyrene, 3,6-dimethylphenanthrene, and triphenylene, all of which have been linked to health problems in humans and animals.

Following that discovery, the farmer installed a water filtration system, which brought the levels of PAHs in the water on the Pennsylvania farm down to levels comparable to those seen at the New York farm. After that, they saw a marked decrease in the birth of dysphagic foals: In 2014, 26

## Bulletin Board

## Gossip

JUN. 12, 2020

percent of all of the farmer's foals had been born dysphagic; in 2015, 41 percent were dysphagic; and in 2016, after the installation of the filtration system, the rate fell to 13 percent.

The researchers believe the reduction in PAHs in the water, along with a reduction in the amount of time the mares were spending on the Pennsylvania farm during their pregnancy, led to the corresponding reduction in birth defects in the horses—though Mullen added that more research is needed to evaluate the toxicity of those chemicals at the levels they observed.

"I think it's a bit soon to say that all farms should have filtration systems installed for their wells," she said, "but this study does provide at least preliminary evidence that well water in places with unconventional natural gas development can see increased levels of PAHs."

A spokesperson for the Pennsylvania Farm Bureau told EHN the organization hasn't yet had time to fully review the study, but noted that "animal health is among the top priorities for Pennsylvania farmers, and scientific research plays a critical role in helping farmers develop practices to best care for their animals and understand factors that may affect their animals' health."

Mullen said she believes the study adds to the growing body of literature linking fracking to problems with human fetal development.

"Horses are often sentinels of health risks to humans," she said. "Right now we can only speculate that what we saw in these foals also translates to human health risk, but the implications are certainly worrisome."

ehn.org, 29 May 2020

<https://www.ehn.org>

# Bulletin Board

## Curiosities

JUN. 12, 2020

### Do bike-share programs actually increase bike commuting? Here's what 10 years of data tells us

2020-05-25

Those bike-share racks dotting the street corners of 50 U.S. cities actually work: They spike bike commutes by 20%, according to a [new study](#) published in the *Journal of Policy Analysis and Management*.

This is news: Daily commuter routes are difficult to track, and no one knew for what purposes people rented the bikes. "This study shows that bike-share systems can drive a population to commute by bike," [says the study's author](#), Dafeng Xu, an assistant professor of urban policy at the University of Washington. He studied a decade of commuting data from 38 cities with bike-share systems.

Bike-share systems first appeared a decade ago in the U.S. (they are common in some cities in Europe and Asia), and some failed due to too few locations. Xu found that bigger bike-share systems do result in more commuters. "In general, biking is good and healthy, and it means less pollution and traffic, but it can be expensive, and people worry about their bikes being stolen," Xu said. "Bike share solves some of these problems, because people don't need to worry about the cost and theft."

But nationwide, bike commute rates are quite low, [just 0.6%](#) according to 2013-2017 figures, with a few standout cities, like Portland, Oregon, which boasts a [5.3% bike commute rate](#). Bike-share cities had a 1% bike commute rate in 2008, which rose to 1.7% in 2016, while at the same time, car commute levels in those cities dropped from 66% to 59%.

Xu encourages bike-share companies to expand bike racks to outlying communities and increase allowable rental time, which is often capped at 30 minutes per fee. Bike commutes are [expected to spike again following the pandemic](#), as people steer clear of crowded public transit.

fastcompany.com, 25 May 2020

<https://www.fastcompany.com>

### Tired of plastic? These businesses have ideas for you

2020-05-27

The [coronavirus pandemic](#) and fears about its spread have brought to a screeching halt years of efforts to get Americans to do one small thing: bring their own bags to the grocery store and stop using plastic ones.

# Bulletin Board

## Curiosities

JUN. 12, 2020

[California has allowed stores to use plastic bags until late June](#) under an executive order from Gov. Gavin Newsom, even though the state has had a plastic-bag ban since 2016. New York [delayed enforcement](#) of its ban until June 15. Other cities and [states](#) have taken [similar steps](#) with [backing from the plastic industry](#), despite evidence that the [virus can survive longer on plastic](#) than on other surfaces (like paper or cloth).

The pandemic came at a time when momentum was building for a shift away from plastic, with many consumers demanding alternatives or halting use of products ([plastic straws](#)) altogether. Although about 72 percent of Americans say they actively try to limit their plastic use, according to a [2019 Pew Research Center survey](#), the amount of plastic waste per person has remained constant: about 4 ounces per person every day, for a total of about 15.6 million tons in 2017.

But to those who are working on alternatives to single-use plastic, the consumer momentum is not disappearing. In fact, founders of several plastic-alternative companies said that they had seen even more interest from consumers in their products, and a renewed commitment from some of the larger companies they work with to press on. "We're fortunate enough that we aren't seeing anyone say, 'I'm not worried about sustainability, I'm just going to focus on survival right now,'" said Troy Swope, co-founder and chief executive of [Footprint](#), which produces fiber-based alternatives to single-use plastics (cardboard, essentially). "If anything, we've seen an acceleration," he added, since companies often see a boost from using sustainable packaging.

Mr. Swope said that his product, which supplied [food service items at this year's Super Bowl](#), was different from other fiber-based alternatives in several ways. The most important are a shelf life that is comparable to that of plastic, which helps prevent additional food waste; complete biodegradability and compostability; and the ability to be microwaved, unlike plastic.

Footprint was born of Mr. Swope's work for 15 years as an engineer at Intel, where he became an "accidental environmentalist." He saw firsthand the many different elements of plastic packaging that accompanied Intel products and was stunned by the amount of waste in the shipping and in the supply chain in general. He was even more alarmed that silicon wafers, elements of Intel's processors, were considered contaminated after being transported in plastic that was similar to the tubs of cut fruit from the grocery store.

# Bulletin Board

## Curiosities

JUN. 12, 2020

“We found the same level of contamination on the food that we did on the wafer,” he said, adding, “if it’s bad for a wafer, it’s bad for a human.”

Mr. Swope described a trip to Hawaii with Yoke Chung, his Footprint co-founder and colleague at Intel, many years ago where they realized that, because of ocean pollution and climate change, they were going to have to tell their children “what the ocean used to look like.”

“So that combination of what we saw happening to the ocean, and the food contamination and, later on, what it was doing to our kids, made us say, ‘Let’s go do something about it.’” Ocean plastic in particular has captured the public imagination, and seems to be a jumping-off point for several companies developing plastic alternatives, both in source material and in the pollution they are trying to prevent. One such company is [Notpla](#), which uses seaweed extract to create its plastic alternative.

Notpla’s main innovation is a small pouch it calls [Ooho](#), made from seaweed and other plants. This little pod (similar to a detergent pod), which is edible and biodegrades in four to six weeks, is the ideal replacement for single-serving condiment packets, said Pierre Paslier, the company’s co-founder and co-chief executive, who used to develop packaging for L’Oréal. “We use plastic for five minutes, and it ends up in the ocean for 100 years,” Mr. Paslier said, explaining the company’s interest in providing alternatives to plastic used for on-the-go foods.

Last year, Notpla partnered with Lucozade, a sports drink, to [hand out capsules at an aid station at the London Marathon](#) instead of single-use cups. The company achieved some [moderate internet fame](#) last year when Glenlivet, a Scottish distillery, unveiled whisky cocktails in edible Notpla pouches for a limited period, though seaweed is not a traditional whisky pairing. Notpla has also created a pouch for dry goods and a liner for cardboard food containers, which are often sealed with plastic and cannot be easily recycled or composted. Different materials can leave consumers confused, and that inspired Zuleyka Strasner to found [Zero](#), a single-use-plastic-free online grocery store. After a trip to a small island off the coast of Nicaragua where the shores were awash in plastic waste, almost none from the island itself, Ms. Strasner decided to try to live plastic-free for a year and a half.

She lugged reusable jars and bags to grocery stores, feeling self-conscious, she said. “I struggled a lot in those 18 months, and I was like, ‘Nobody is going to be able to do this; nobody is going to live this lifestyle if they have kids or a full-time job.’”

# Bulletin Board

## Curiosities

JUN. 12, 2020

Like an old-fashioned milkman model “with supercharged technology,” Zero Shop drops off groceries in reusable containers — mostly glass and silicone — which are then washed by customers, and picked up with the next delivery. The company, which currently only serves the Bay Area with plans to expand, offers around 400 items, with everything from fresh produce and meat to chips and popcorn.

Ms. Strasner said that the company, somewhat surprisingly, had grown by about 200 percent week over week during the shutdown, and that consumers had not expressed concern about bringing reusable items into their homes. Fewer people, she said, touch her products than those at a grocery store, given the length of the traditional supply chain, not to mention indecisive shoppers.

Ms. Strasner does not use biodegradable and compostable solutions, favoring more permanent materials like glass and silicone. But decay can be productive, too: [Ecovative Design](#) uses mushroom tissue (mycelium) to create a packaging alternative.

Imagine receiving a television set in a box, its corners swaddled in plastic foam. Now, imagine that padding is made of mushrooms.

Ecovative grows packaging by filling custom-shape molds with agricultural residues like wood chips, which act as a food source, and mycelium cells. The mycelium feeds on the wood chips, growing its fibers around and through the food source, and, in four to six days, takes on the shape of the mold, which can then be removed.

Andy Bass, the chief marketing officer of Ecovative, said that the company was mostly “strain-agnostic” when it came to the mushrooms it used to produce its packaging, but that it had also developed its own strains for textiles and plant-based “meats.” Ecovative’s incubators are set to particular temperature and moisture conditions, depending on the strain, which mimic conditions beneath the soil. This way, the mycelium “senses” that it is still underground, and grows only as mycelium fibers (the stalk of the mushroom), rather than as caps. The company has also used this technique to produce [mushroom leather](#).

Ecovative develops its technologies and then licenses them to producers, who can then grow their own mushroom packaging or leather. As a result, it is not a consumer-facing company, so it has been less affected by the pandemic.

# Bulletin Board

## Curiosities

JUN. 12, 2020

However, if the trend of home gardening during the shutdown continues, it could become a bigger part of our pandemic lives than previously thought: Ecovative's mushroom packaging can be used as fertilizer.

In the end, it all comes full-circle, unless it's plastic, which isn't going anywhere.

nytimes.com, 27 May 2020

<https://www.nytimes.com>

### Is it a farm of a sculpture park? Both

2020-05-27

In coming weeks, a new project will begin taking shape in north Minneapolis. It'll look like a basketball court, yet offer farm fresh food and some peaceful spots to sit. And it will help mitigate water pollution.

It's a collaboration among the Walker Art Center, an Iowa-based artist and a local urban farm organization.

Marcus Kar, director of programming in north Minneapolis for the nonprofit Youth Farm organization, described a lot that he leases from the city of Minneapolis on Lyndale Avenue North. It's been derelict since a tornado tore through the neighborhood in 2011.

"Oh yeah, there used to be a house stand on there," said Kar.

But soon — time, seasons and pandemic notwithstanding — it will be the site of an urban farm, a community project and an artwork commissioned by the Walker Art Center. Its name: "Prototype for poetry vs rhetoric (deep roots)."

The Walker's Nisa Mackie says some elements will be sculptural. "The installation itself will be a garden in the shape of a basketball court," she said. "So when you look at the site plan, from a bird's eye view, you can see it's kind of got the line markings."

At ground level, those markings delineate planting beds, pathways and places where you can just sit and take it all in.

It's designed by Des Moines, Iowa-based artist Jordan Weber. He's an environmental artist who works on social justice issues and community organizing. He's also a former collegiate hoops player.

Weber is creating sculptures that will stand in the place of the hoops themselves. He says they will act as rain-catchers that will funnel water

# Bulletin Board

## Curiosities

JUN. 12, 2020

into the gardens around them. Not only will this water the plants, it will also help counteract, at least a little, some of the industrial pollution in the neighborhood.

"And also below each of those hoops we'll have these meditation rocks made of black obsidian," he said. "So you'll have these kind of points where you can actually interact with the project."

"The more vacant lots you activate to mitigate pollution, from the soil, water and air, the more health benefits it's going to have on our brown, black and Indigenous populations that are really overexposed to pollutants," he said.

Both Weber and Kar say the quiet spots are important in an area such as north Minneapolis, where green space is at a premium. And of course this will also be a farm, growing vegetables and herbs, which Kar says are needed locally.

"North Minneapolis is considered a food desert," he said. "There's only a few grocery stores, very far apart from each other."

This is a multilayered project that draws together many different ideas and desires. Weber said it was carefully designed using local input over the last year.

"It was over 80 or 90 meetings with representatives of the north side, and leaders of the north side to really pinpoint a project that would be beneficial for the north side community in general," he said.

The plan was to have the work well underway by now, but as with so many other things, the coronavirus has reshaped the project timeline. Instead of a grand groundbreaking, Weber and Mackie will launch the project with a live discussion on the Walker's Instagram account at noon Wednesday.

The clearing, building and planting will happen in smaller increments in coming months, with workers socially distanced and wearing protective gear.

Even then, Kar hopes it will be to the community's benefit, especially by paying local young people to do the work. "I want to give a stipend and create supplemental impact as part of this project, so that people can see themselves in it," he said. "And drive by and say, 'Hey, I helped on that. I was a part of that.'"

**But soon — time, seasons and pandemic notwithstanding — it will be the site of an urban farm, a community project and an artwork commissioned by the Walker Art Center.**

# Bulletin Board

## Curiosities

JUN. 12, 2020

While things will take shape slowly, the project organizers plan a big opening next year.

[mprnews.org](https://www.mprnews.org), 27 May 2020

<https://www.mprnews.org>

### **Cobalt is critical to the renewable energy transition. How can we minimize its social and environmental costs?**

2020-05-14

Its name conjures an image of vivid deep blues. But when cobalt is dug out of the ground in ore form, there's barely a hint of the rich hue it lends its name to. In the Democratic Republic of the Congo, which produces more than half of the world's supply, it takes the form of heterogenite, a dull brownish mineral that could easily be mistaken for small clods of dirt.

But people die for this mineral. Children suffer for it. Livelihoods, educations, neighborhoods, environments and personal safety are sacrificed for it.

That's because cobalt is hot property. It's used in medicine for imaging, cancer radiotherapy and sterilizing medical equipment. It's in the rechargeable batteries in smartphones and laptops. And it's a component of the lithium ion batteries that power electric vehicles and store energy from solar, wind and other renewable sources, giving it an essential role in the transition from fossil fuels to green energy. One report forecasts that global demand for cobalt will increase 60% above 2017 levels by 2025, with batteries projected to make up more than half of that use.

As interest in cobalt has grown, so has interest in ensuring that it's ethically produced, minimizing harm to the people who mine it and the environment from which it's removed.

#### **Issues Abound**

Some 60% of the world's cobalt supply comes from the Democratic Republic of Congo (DRC), where nearly three-quarters of citizens live in extreme poverty.

Around one-fifth of cobalt mined in the DRC comes from small-scale artisanal mines. People, including children as young as 7 years old, work in hazardous conditions without gloves to protect them from contact dermatitis, breathing cobalt-laden dust that is associated with

# Bulletin Board

## Curiosities

JUN. 12, 2020

a potentially fatal lung disease. Miners work in unsafe tunnels that are liable to collapse and bury them, all in settings that are prone to violence and sexual exploitation.

"There's a whole range of human rights violations connected to cobalt mining in the DRC, generally stemming from the fact that it's just a very poorly regulated activity by the Congolese government," says Mark Dummett, head of business, security and human rights at Amnesty International.

Most cobalt extraction in the DRC takes place in larger industrial mines. Dummett says these come with their own issues, such as pollution. Unfortunately, there's very little information on — or assessment of — the environmental impact of these bigger cobalt mines.

Nazmul Huda, senior lecturer in mechanical engineering at Macquarie University in Sydney, recently co-authored a life-cycle analysis of the environmental and human health impacts of cobalt production from raw material to purified end product. He and his co-authors found it difficult to draw conclusions about cobalt mining in the DRC because there simply wasn't enough research done on it.

Instead, they looked at cobalt mining in Australia, where cobalt is removed as a byproduct of copper and nickel extraction. Even though mining in Australia is highly regulated, Huda and colleagues found that this method of cobalt extraction comes with a hefty environmental price tag — mainly because of the greenhouse gas emissions generated by the fossil fuels used in the process.

"We have the mining equipment, we have heavy machinery that are used in creating the open mine or underground mining process, then there's the electricity used in the entire production chain, and then we have the blasting process," Huda says. "From what I can see, it's not sustainable for longer term."

#### **Due Diligence**

Outside the DRC, the social and environmental issues associated with cobalt mining have been largely unknown for some time. However, increasing demand for cobalt to underpin the energy transition has brought them to international attention.

That's why there's now renewed focus from end users, such as tech companies and consumers, on the cobalt supply chain, with some of the biggest tech companies in the world encouraged to do their due diligence

**But people die for this mineral. Children suffer for it. Livelihoods, educations, neighborhoods, environments and personal safety are sacrificed for it.**

## Bulletin Board

## Curiosities

JUN. 12, 2020

on the cobalt they include in their products and make sure that they are able to trace that cobalt through the entire supply chain and ensure it is responsibly sourced. The consequences of not doing so became very clear in December last year when some of those tech firms — Apple, Alphabet (Google), Dell, Microsoft and Tesla — were the subject of a [lawsuit alleging](#) they aided and abetted in the death and injury of children working to mine cobalt that has ended up in their products.

## Bottom of Form

Amnesty International has published [two major reports on human rights and environmental issues associated with cobalt mining](#) and launched an initiative that challenged the electric vehicle industry to produce a battery with a completely clean human rights record for all its components. And the Business & Human Rights Resource Centre, an international nongovernmental organization, has developed an online tool called the [Transition Minerals Tracker](#) to keep close tabs on human rights allegations associated with minerals such as cobalt that are key in the transition to renewable energy and a low carbon economy.

“We launched this tool so it can be used by investors but also companies at the end of the supply chain to just understand who are the actors at the top, what are their policies and, hopefully, could they engage with them to change some of these things,” says Stephanie Regalia, natural resources research assistant at the center.

At the Responsible Business Alliance, the Responsible Minerals Initiative is helping companies understand and improve the social and environmental performance of their cobalt supply chains. The alliance recently teamed up with [RCS Global Group](#), a company that specializes in responsible sourcing of materials, to expand assessment, monitoring and improvement of artisanal and small-scale cobalt mining practices in the DRC. The aim is to increase the transparency of the supply chain, with the hope that this will lead to safer, less exploitative practices in those mines.

Alliance vice president Leah Butler says the world can draw on past experience with tungsten, tin, tantalum and gold — the so-called [3TG conflict minerals](#) — to avoid the same mistakes with cobalt.

“From 3TG we know that this can be done,” she says. “Companies can get clarity on where they’re sourcing cobalt from, and with that knowledge we can work on improving the practices of those sources.”

## Bulletin Board

## Curiosities

JUN. 12, 2020

And it is generating change. Butler says the Responsible Business Alliance now has over 50% of globally identified cobalt refiners — the companies buying and processing cobalt from small-scale and artisanal mines — in its program, largely because of customer demand for ethical and sustainable products, investor expectations of responsible sourcing, and global interest in the social and environmental costs of minerals. The programs help refiners to assess baseline conditions in the mines they source cobalt from and work with those mines to improve conditions, for example by implementing zero-tolerance policies around child and forced labor.

But have these commitments made a difference on the ground in the DRC? Dummett says there are positive signs of change. A school mentioned in Amnesty International’s first report on cobalt, an institution that seeks out children from mine sites and provides free education in a nation that otherwise cannot offer it, has since received sizable donations that have enabled it to open up at least five new schools, teaching thousands of children rescued from the mines.

According to Dummett, the Congolese government has introduced some important initiatives to address the issues with artisanal mines, such as the creation of “model mines” where heavy machinery is brought in to remove the top layer of soil and exposed the heterogenite, reducing the need for miners to hand-dig precarious tunnels. Such mines, he says, are also closed off to ensure children do not enter.

“These are examples of how companies and the government are looking for ways to make artisanal mining safe and responsible and fair,” Dummett says. “Maybe they haven’t got there yet, but they’re heading in the right direction.”

Another government initiative, he says, is to create official areas where artisanal mining can take place, which lends the mines a legitimacy that makes it easier for miners to form cooperatives, borrow money and bring in bigger equipment to make mining safer.

**Recycle or Replace**

Another avenue being explored to reduce adverse impacts of cobalt extraction is [improved recycling](#), which would reduce the need for mining in the first place. In February 2019, the U.S. Department of Energy invested in a pilot plant called the [ReCell Center](#) to explore cost-effective ways to reclaim the lithium and cobalt from lithium ion batteries. At about the same time, it launched a US\$5.5 million prize for solutions to collecting, storing and transporting discarded lithium ion batteries. Meanwhile, the

## Bulletin Board

## Curiosities

JUN. 12, 2020

U.K. has its own battery recycling initiative called Reuse & Recycling of Lithium-ion Batteries, or ReLiB, focused on recovery of valuable materials like cobalt from these batteries.

A Japanese company, Sumitomo Metal Mining Co., Ltd., recently announced it had developed a method for melting down spent electric vehicle batteries and recovering the cobalt. However, the company acknowledges that it will take some time before large amounts of used batteries will become available for recycling.

What about doing away with cobalt altogether, as Tesla recently announced it was planning to do? Regalia says that when a mineral becomes ethically tarnished, there's the temptation to exclude it from the supply chain and look for an alternative. But their research has found that no transition mineral is perfect; lithium, manganese, nickel and zinc are all associated with human rights violations.

And to shun cobalt altogether would also mean denying a valuable source of income to people who need it more than many, Dummett argues.

"Artisanal mining is also a lifeline for millions of the world's poorest people, [so] we don't want to see it outlawed," he says. "There are ways in which it can be done responsibly and fairly and safely, without children, and that's what we'd like to see."

The human cost of cobalt mining — once a problem largely hidden from end-users of the mineral — has now been highlighted more broadly, and the eyes of the world, especially consumers, are open. This gives Regalia cause for hope, but she says there is still a long way to go.

"Right now we do have to acknowledge that the realities are still very much alive, in that environmental, human rights concerns are still very much present in the DRC," she says. "It's a situation that's been noticed. It's not a situation that's been solved yet."

ensia.com, 14 May 2020

<https://www.ensia.com>

### In the walking capitals of the world, drivers still rule the road

2020-05-30

BY INTERNATIONAL STANDARDS, London is a fairly walkable city. In 2018, one of every four trips was made primarily by foot. And the city is aiming

## Bulletin Board

## Curiosities

JUN. 12, 2020

for even more, with aggressive plans to improve conditions for pedestrians and cyclists in order to decrease traffic and emissions and the added benefit of keeping Londoners healthy during lockdown. Even so, London's foot traffic is measly compared with cities in sub-Saharan Africa, where 40 to 60 percent of travelers move around by foot. People walk in the sub-continent more than anywhere else in the world.

And yet, walking in sub-Saharan African cities is incredibly dangerous. The continent has the highest rate of road fatalities in the world. Most roads have no sidewalks or street lights, and pedestrians are often forced to walk alongside motorized vehicles. "We don't really enforce the [speed] limits in Kenya," says Cyprine Odada, an urban planning consultant in Kenya's capital, Nairobi. "[Pedestrians] are the most vulnerable road users, and the lack of footpaths only exposes them to more dangers."

African cities are growing at an unprecedented rate, and without the type of urban planning that can accommodate the flow of pedestrians. Much of the expansion is taking place at the cities' edges, where roads and reliable public transit are lacking. The majority of walking trips originate in slums, where residents sometimes can't even afford to ride whatever form of collective transport is available, whether it's a public bus, a privately run minivan, or a moto-taxi. This means millions more people are likely going to walk even longer distances in the years to come, but urban and infrastructure planning has mostly focused on making way for more cars, not people. As a result, cities have been left to grapple with how to protect pedestrians from the dangers of the road, while also changing social norms to lower the dependence on cars.

In Nairobi, the population growth paired with a focus on car-oriented urban development has created increasingly dangerous conditions. Sixty-five percent of the city's traffic deaths are pedestrians. As Nairobi swells it's added roughly 1.3 million people in the past 10 years the government has prioritized building roads and highways to accommodate private vehicle traffic. But it's doing so without considering the people walking alongside the roads, or promoting alternatives to driving. The Thika Superhighway, a \$362 million project that crosses through several urban areas, was originally built without footbridges for pedestrians. "We've been having discussions with the [Kenyan National] Highway Authority to have them be more flexible and understanding of how they design their roads," Odada explains.

With congestion from road traffic increasing, many drivers across the continent are turning to active transport as an alternative. But while it's

## Bulletin Board

## Curiosities

JUN. 12, 2020

more efficient, it's not necessarily any safer. Odada herself started cycling, and only then realized how dangerous Nairobi's roads can be. "Pedestrians looked like they feared for their lives. These are things I couldn't see when I was in my car driving, or in a matatu [the minibuses used for public transportation]," she recalls. "I felt really, really embarrassed." Her training as an urban planner didn't include anything about footpaths or bike lanes. She now organizes Critical Mass Nairobi, a monthly riding event for cyclists, and actively advocates for sustainable transport.

Things are changing in the city, albeit slowly. Nairobi has a new policy that dedicates 20 percent of its road construction budget to non-motorized transport, and requires all new roads to include sidewalks. Several kilometers of bike paths have been added in the last few years. But the city's master plan itself makes few mentions of infrastructure for pedestrians and cyclists, which makes it difficult for engineers to design roads accordingly, Odada says. "We failed from the planning phase by planning our streets in a way that pedestrians were not considered the king. We planned for the movement of private cars."

The political context doesn't always help. Some urban projects have been delayed after Nairobi's governor, Mike Mbuvi Sonko, was arrested on corruption charges late last year.

Kenya's neighbor to the north, Ethiopia, has made more progress. Last year the capital, Addis Ababa, adopted a 10-year strategy for promoting non-motorized transport. It has started construction on 600 kilometres (373 miles) of sidewalks with safe crossings and street lighting, as well as 200 kilometres (124 miles) of protected bicycle lanes, among other projects.

In many African countries still, car ownership is seen as a sign of social status, and making way for other forms of mobility has the added challenge of signalling drivers that they no longer rule the road. One of the most effective measures taken by Addis Ababa was to install bollards on sidewalks and bike lanes so that drivers would learn to stay off.

Addis Ababa's strategy marks a new way of understanding how transport infrastructure and policies intersect with other goals, from reducing greenhouse gas emissions to improving road safety and promoting low-cost mobility, says Chris Kost, the Africa director for the Institute for Transport and Development Policy, which helped develop the strategy. "There's a good appreciation of how all of these elements are interlinked, and how walking and cycling can be part of the country's largest strategy for improving economic well-being."

## Bulletin Board

## Curiosities

JUN. 12, 2020

Yet the safety and ease of walking is influenced by factors that go beyond street design. The size of street blocks, building design, and street connectivity also have a role to play short streets lined with ground-level shops provide a level of activity that makes it safer to walk along, for instance. But in many African cities, private developments tend to favor walled-off compounds, which are perceived as safer.

These problems are not unique to sub-Saharan Africa. Street sprawl is growing on all continents, major urban centers are still without sidewalks, and road deaths are on the rise in the US. As people around the globe rediscover the joys and benefits of walking and cycling during lockdown, cities and planners might finally give active transport the boost it deserves.

wired.com, 30 May 2020

<https://www.wired.com>

### The birds are not on lockdown, and more people are watching them

2020-05-29

The adult male scarlet tanager is a medium-size songbird with glaring crimson feathers and jet-black wings.

It can be hard to spot, because the species tends to forage among the upper branches of tall trees. But it does come down to earth, and sometimes can be caught hanging out with pigeons outside of the Freeport Wild Bird Supply store in Maine.

It is the kind of sighting that can spark a lifelong interest in bird-watching, said Derek Lovitch, 42, a birder and biologist who runs the store with his wife, Jeannette.

"The scarlet tanager is one that gets a lot of people into it, because you've got to know: What is that thing?" Mr. Lovitch said. Business is booming at his supply store, and he's seeing younger customers than usual. But it's not the scarlet tanager that has gotten so many people interested in birds in recent months. It's the coronavirus pandemic.

"There is definitely a craving for engagement with nature, especially considering how limited our ability to move is right now," Mr. Lovitch said.

Bird-watching has surged in popularity this year. According to the Cornell Lab of Ornithology, birders set a world record on May 9 for Global Big Day,

**"But this year is sort of off the charts," he said.**

## Bulletin Board

## Curiosities

JUN. 12, 2020

an annual bird-spotting event. Participants using the lab's [eBird](#) platform reported more than two million observations — the most bird sightings documented in a single day — and recorded 6,479 species. Spring is always a busy season for bird-watching, said [Marshall Iloff](#), a project leader at the Cornell lab. "But this year is sort of off the charts," he said.

At a time when humans are nervously tracking the spread of a virus as it seeps [through communities](#) and leaps [across borders](#), new birders are finding relief in tracking the migratory patterns of great blue [herons](#), mountain [yellow-warblers](#) or ruby-throated [hummingbirds](#) instead.

For Layla Adanero, who was working as a business analyst in Manhattan until she was furloughed in April, bird-watching has been a respite from the faster-paced life she left behind when she moved back home to London.

Now the chirps and coos in her backyard, once ignored as background noise, have become clues to understanding an entire ecosystem.

"It's quite meditative to watch another life form go about its day," said Ms. Adanero, 23. "It's like another way of practicing mindfulness."

Her recent sightings include an adult [long-tailed tit](#), a fluffy little bird with a white head and dramatic black tail feathers; and a [great spotted woodpecker](#) in a busy pattern of black and white, with spots of red.

There's something symbolic about watching the birds fly while she is in lockdown, Ms. Adanero said: "They represent the ultimate freedom of movement."

Corina Newsome, 27, an avian expert and graduate student of biology at Georgia Southern University, said the coronavirus lockdowns coincided with spring migration — the perfect time for new birders to look to the sky.

"I think it will end up making us better stewards of our natural space, as well as give us peace and calm to see that even though our rhythm is interrupted, there is a larger rhythm that continues to go on," Ms. Newsome said.

This month, she [was excited to spot](#) a purple [gallinule](#), a jewel-toned species that uses its long legs to hop across lily pads.

Ms. Newsome noted that the birding community was [not particularly diverse](#) and might not seem welcoming to everyone. "Birding groups are

## Bulletin Board

## Curiosities

JUN. 12, 2020

typically white and older people," she said. "It can feel uncomfortable as a young black person."

But anyone can take up birding, she said, adding that it was incumbent on white birders to [condemn racism](#) in the community, and helpful for bird watchers of color to encourage each other.

During the lockdowns, she has been fielding more birding questions on social media from newbies, amateurs and parents introducing the pastime to their children.

In New Orleans, Rebekah Bradshaw, 41, started bird-watching as a way to keep her three children active after schools closed. Her son Liam, 11, said he had used a phone app to log about 150 species, including [ruddy turnstones](#) and [yellow-crowned night herons](#).

"He's at that age now where he can really get sucked into the screen," Ms. Bradshaw said. "So I was like, 'Let's go bird-watching.' Both of my big kids really got into it, and even the baby now walks around outside looking at the sky saying: 'Bird! Bird!'"

Some birds are drawn to the Bradshaws' area because they live close to the Bayou St. John and Lake Pontchartrain. But birding is a hobby that city dwellers, rural residents or suburbanites anywhere can try.

Nathalie Couzon, 31, has been largely confined to her third-floor apartment in Bangkok because of the coronavirus. She usually makes YouTube videos about her [travels](#), but lately she has been [turning her camera on the birds](#) that gather in treetops outside.

"I transferred my hobby from the national parks to my balcony," she said.

Her sightings there have included yellow-vented [bulbuls](#), Asian [koels](#) and the coppersmith [barbet](#) — her favorite — so named because its metronomic calls ring out like a hammer hitting metal. "You can hear it everywhere," Ms. Couzon said. "It's pretty small, but so colorful. If you see it, you will love it from the very first glance."

Sightings like these are useful to scientists, too. [Amateur birders can contribute](#) to global databases like eBird at Cornell, which helps biologists and conservationists [track bird populations and migration patterns](#).

"It's been used by researchers all over the world in ways that we never predicted," said Mr. Iloff, the project leader from the lab.

## Bulletin Board

## Curiosities

JUN. 12, 2020

Ms. Newsome uses the program, and the data entered by her and other birders helps contextualize sightings for people who use the lab's free [Merlin app](#). That's the one Liam uses in New Orleans.

In London, Ms. Adanero uses an app called [Smart Bird ID](#) to identify species, and she has nudged her 10-year-old sister to do the same.

And in Bangkok, Ms. Couzon is relying on an old-fashioned paperback: "[A Field Guide to the Birds of Thailand](#)." She is considering buying binoculars, and she knows what she's after next: the red-eyed [greater coucal](#), a rusty-winged bird whose [haunting call](#) she hopes to capture on camera.

It will require patience. But she has cultivated a lot of that in lockdown, with bird-watching as one of her favorite ways to pass the time.

"If you're staying at home, especially in confinement, and you want to see some nature," she said, "you can just open your window."

[nytimes.com](#), 29 May 2020

<https://www.nytimes.com>

### From beetles to butterflies, scientists and landowners are working together to bring endangered insects back from the brink

2020-05-28

Bob Merz took it for granted that the unassuming American burying beetle would be in Missouri somewhere, under the soil surface, doing its job of slowly nibbling away the waste of the world.

Merz, director of the [Center for American Burying Beetle Conservation](#) at the Saint Louis Zoo, knew the beetle had been seen in neighboring states and even bet a coworker that they'd find the bright orange-spotted insects after undertaking a survey of them all over Missouri starting in 2001. He lost that bet.

"We looked for years," he says. "There were no beetles found."

As a lifelong insect observer, Merz found that tremendously unsettling. "To lose a whole species and not even notice it is kind of startling to me," he says. "It was a personal wake-up call that things are off."

The American burying beetle is not the only invertebrate quietly slipping away. Stories of an "insect apocalypse" came to a head in 2018 as scientists sent out the alarm on the [dramatic loss of populations](#) around the world.

## Bulletin Board

## Curiosities

JUN. 12, 2020

But there's another story that the American burying beetle is a part of. It's the less-told but equally important story of bringing uncharismatic minifauna back from the brink through cooperation among sometimes-opposing groups: private landowners, public officials and conservation activists.

#### Missing Beetles

The American burying beetle is a vital part of soil ecosystems, breaking down dead things and allowing the nutrients they hold to move back into the living world. It was once found in at least 35 states, but in 1989 it was declared endangered due to land use change and other factors. The remaining populations are found predominantly in the Midwest, including states bordering Missouri. Southwestern Missouri shares similar prairie habitat to these states, so the Saint Louis Zoo began breeding the insect and reintroducing it to that region in 2012.

As zoological manager of invertebrates with the Saint Louis Zoo, Kayla Garcia oversees the breeding of the beetles. At the zoo, the beetles are paired up, then given a dead quail. The female lays eggs on the quail and once the grubs hatch, the parents work together to feed the babies, a rare action in the insect world, notes Garcia. After grubs mature, zoo staff collect the adult beetles to either be used in breeding or released at various sites around southwestern Missouri.

Local officers from the Missouri Department of Conservation talk to local landowners to give them a heads-up on the beetle reintroduction. The presence of an endangered species on private land can activate a [law](#) that limits how that landowner can use the land. So the Saint Louis Zoo, working with the U.S. Fish and Wildlife Service, [designated](#) this population of the beetle as a nonessential experimental population, or NEP. That means local landowners can still farm even if the beetle is found on their property.

Achieving NEP designation and having local conservation officers reach out was a great way to get landowners to cooperate with the introduction, says Merz. Some property owners, understanding the beetle's value to the ecosystem, even asked the zoo to survey their land to see if the beetles have set up shop.

The zoo has been releasing roughly 200–600 beetles every year since 2012. Last year's survey yielded 39 beetles, including 29 offspring of the zoo-bred beetles.

# Bulletin Board

## Curiosities

JUN. 12, 2020

The hope is that “they will be able to reestablish themselves on these lands without our active intervention and hopefully expand where they’re found,” Garcia says.

### Multilayered Benefits

The American burying beetle is one of the few insect reintroduction projects around the country. Other notable initiatives include [bringing back the Karner blue butterfly](#) to parts of the Upper Midwest and reintroducing the Puritan tiger beetle in [Connecticut](#). More common than reintroduction efforts are incentive or education programs to encourage landowners to grow plants that support pollinators.

That type of project is vital in Iowa, where some 98% of land is privately owned, according to Peter Berthelsen, president of Conservation Blueprint and partnership director of The Bee & Butterfly Habitat Fund.

“If you want to have a significant impact on the environment, you have to do that working with agriculture and private landowners,” Berthelsen says. “That’s where the rubber hits the road.”

Berthelsen’s organizations supply private landowners with seed packets for plants that support pollinators. In a [project with the Iowa Soybean Association \(ISA\) and agribusiness Syngenta](#), Berthelsen is providing farmers packets to grow plants that support the endangered rusty patched bumble bee. Berthelsen says that Syngenta covers the cost of the seeds, and the ISA reaches out to its members to find places to plant the seeds.

Berthelsen says farmers can plant the seeds near streams, waterways or spare fields. “If you want to have the most significant environmental benefits possible, you need to work very collaboratively, trying to address as many issues as you can,” he says. If a landowner plants wildflowers next to a stream, it’s not only helping pollinators, but also prevents erosion and nutrient runoff. “It’s multilayered benefits.”

Through the Bee and Butterfly Habitat Fund, Berthelsen says farmers receive free seed mixtures for wildflower plantings 2 acres (0.8 hectares) or larger. In addition, he provides guidance on how to prepare, plant and manage the site. Seed selection is based on the needs of the farmer and site constraints.

The idea is to think about habitat with biodiversity in mind, says Berthelsen. Instead of looking at a project to just benefit monarchs or bumble bees, habitat projects can be designed that address the whole

# Bulletin Board

## Curiosities

JUN. 12, 2020

gamut of soil health, water quality, pollinator needs, grassland songbirds, pheasants and quail, “all of those things can and should be part of the recipe for when a seed mixture is designed and created and we work with a landowner,” he adds.

“There’s room for conservation on every farm and ranch on the country, and those are the opportunities where we can have significant benefits from the environment.”

### Bottom of Form

And, according to Merz, it’s not difficult for local landowners to understand and value biodiversity: They realize that insects are canaries in the coal mine when it comes to alerting people to problems that need attention. One of the landowners near the burying beetle survey sites, for example, mentioned that he used to hunt gamebirds like pheasant on his land, but those birds, like the beetles, have disappeared.

“It tells me that something is wrong with the ecosystem, and I think most people get that,” says Merz.

[ensia.com](#), 28 May 2020

<https://www.ensia.com>

### These bacteria have adapted to life in your nose—and that may be good news

2020-05-27

Like a sprawling urban city, certain neighborhoods of the human body support different communities of microbes. And many of these are good guys; the microbes in our gut help us digest food, for example, whereas those on our [tongue](#) and [skin](#) can guard against invading pathogens. Now, researchers have found beneficial bacteria in our nose as well. This “nasal microbiome” may guard against chronic sinus inflammation or even allergies.

The study is “an important gateway” to recognizing bacteria’s protective qualities in a new part of the body, says Maria Marco, a microbiologist at the University of California, Davis, who was not involved with the work. “There’s been some work done in the past, but this is the first study that goes in depth.”

To conduct the study, researchers co-led by Sarah Lebeer, a microbiologist at the University of Antwerp, went sleuthing for bacteria in the noses of

**This “nasal microbiome” may guard against chronic sinus inflammation or even allergies.**

## Bulletin Board

## Curiosities

JUN. 12, 2020

100 healthy people. Then, the scientists compared the microbes they found with those from hundreds of patients with chronic nasal and sinus inflammation.

Of the 30 most common types of microbes the team discovered, one group stood out: antimicrobial and anti-inflammatory bacteria called *Lactobacillus*. These were up to 10 times more abundant in the noses of healthy people, the researchers publish today in *Cell Reports*.

Lactobacilli usually thrive in oxygen-poor areas, so Lebeer was surprised to see them in an organ flush with fresh air. But a closer look revealed that the particular strain her team found in human noses has special genes called catalases that safely neutralize oxygen—a rarity among other lactobacilli. “They seem to have adapted to that environment,” Lebeer says.

Under a microscope, the researchers could also see tiny, hairlike appendages called fimbriae that anchor the bacteria to the nose’s inner surface. Lebeer thinks the microbes may also use the hairs to bind to receptors on skin cells inside the nose, prompting the cells to close like a trap door. With fewer cells open, allergens and harmful bacteria have a harder time getting inside them.

But on its own, the presence of *Lactobacillus* in healthy people is not enough to say it guards against disease, Lebeer admits. Whether the microbes are protective is also difficult to test in animal models such as mice, which have very different noses.

And some experts aren’t convinced that the lactobacilli the team found are uniquely adapted to the human nose. The mouth is also home to millions of lactobacilli, notes Jens Walter, a microbiologist at University College Cork, and these could end up in the nose through sneezing. The results of the study are “the right first steps,” Walter says, but he would like to see more research to reinforce their novelty and potential benefits.

Ultimately, Lebeer hopes to develop therapeutics using nasal probiotics. Sinus conditions have few treatments, and chronic conditions that must be continually treated raise the risk of a bacteria becoming resistant to antibiotics. Introducing beneficial strains of bacteria lacking antibiotic resistance genes would be a lower risk solution, she says.

## Bulletin Board

## Curiosities

JUN. 12, 2020

As a first step, Lebeer has developed a nasal spray containing the *Lactobacillus* microbes her team isolated. The lactobacilli safely colonized the patients with no ill effects.

sciencemag.org, 27 May 2020

<https://www.sciencemag.org>

### NASA and SpaceX launch astronauts into new era of private spaceflight

2020-05-30

Space history has been made. On 30 May, SpaceX and NASA launched two astronauts to space aboard the Crew Dragon spacecraft, the first time a private company has flown humans into orbit, and the first crewed launch from the US since the end of the Space Shuttle programme in 2011.

“This is the first time that SpaceX has ever launched astronauts, and it’s also the first time that a government has trusted a commercial company to launch astronauts to orbit,” says space consultant Laura Forczyk. “It is a big deal.”

The launch was first set to take place on 27 May, but poor weather caused it to be delayed. By the 30 May backup date, the weather had cleared and NASA astronauts Bob Behnken and Doug Hurley successfully lifted off and headed on their way to the International Space Station (ISS).

It took the Crew Dragon spacecraft about 19 hours to reach the ISS. The spacecraft docked with the ISS autonomously, but before they arrived, Behnken and Hurley had a chance to fly the capsule manually as a test. “It flew just like it was supposed to,” said Hurley after the astronauts arrived at the ISS. “It is exactly like the simulator and we couldn’t be happier about its performance.”

Now that they are safely aboard the ISS, they will continue to perform tests on Crew Dragon. They will remain on the ISS for between one and four months, joining the three astronauts already there in conducting scientific experiments, before getting back into the Crew Dragon to come home.

As the Falcon 9 rocket carried the Crew Dragon into orbit atop a plume of flames, it marked a new era of human space flight. “I’ve heard that rumble before, but it’s a whole different feeling when you’ve got your own team on that rocket,” said NASA administrator Jim Bridenstine after the launch. Now that SpaceX can bring humans to the ISS, NASA will no longer have to

**“This is the first time that SpaceX has ever launched astronauts, and it’s also the first time that a government has trusted a commercial company to launch astronauts to orbit,” says space consultant Laura Forczyk.**

## Bulletin Board

## Curiosities

JUN. 12, 2020

purchase seats aboard the Russian Soyuz spacecraft, and will have much more flexibility in sending astronauts to space.

A flight aboard the Crew Dragon is also less expensive than other crewed launches. "This is absolutely opening the doors for more people to go to space," says Forczyk. "In the future, SpaceX could open it up to private astronauts, whether that's for commercial space tourism, or Tom Cruise going to film a movie, or another government that doesn't have the capability launch astronauts itself."

This is a big step towards making space flight more of an everyday phenomenon, and maybe eventually allowing ordinary people to visit space, said NASA astronaut Leland Melvin during a live webcast of the launch. "We've had people that paid their way on a Soyuz rocket to go, but it's really the billionaire boys' club," he said. "It costs so much money to go to space, and I think that price point will come down as we start to make that more amenable for everyday people."

newscientist.com, 30 May 2020

<https://www.newscientist.com>

### This kind of coal could fuel COVID-19 recovery

2020-05-26

While the coronavirus pandemic has dragged down economies worldwide, a segment of the coal market that's attracted little attention from environmentalists remains strong.

Coking coal is one of just a few mined commodities that financial experts expect to hold its value in the coming months and years. That's because China — where the novel coronavirus first emerged in December — already is using it to churn out steel and Wall Street hasn't shied away from investing in coking coal, experts say.

COVID-19, the potentially deadly respiratory disease caused by the coronavirus, is now largely under control in China. As a result, the world's largest producer of planet-warming carbon dioxide emissions is roaring back to life.

"China is the swing buyer of coking coal," said Monica Bonar, a senior director at the research firm Fitch Ratings Inc., in an interview last week. "If they buy less, it drives the price down. If they buy more, it drives the price up."

**In 2011, China produced 46% of the world's steel, the IPCC found.**

## Bulletin Board

## Curiosities

JUN. 12, 2020

At high temperatures, steelmakers can use coking coal to reduce iron ore into liquid metal. But that process, which has been around since the 19th century, is a major source of the carbon dioxide emissions heating up the globe.

The steelmaking sector overall accounts for more than 4.8% of global industrial carbon emissions, according to the U.N. Intergovernmental Panel on Climate Change. In 2011, China produced 46% of the world's steel, the IPCC found.

Currently, coking coal goes for about \$140 per ton, and Fitch predicted in an April report that it would stay around that price through at least 2023. Thermal coal used to make electricity, on the other hand, is generally going for half that rate. Fitch doesn't expect thermal coal prices to inch upward until next year.

### China's recovery fueled by coking coal

In recent months, Chinese companies have been buying and cooking coking coal to build up their steel inventories ahead of a potential Beijing-led building boom, said Lauri Myllyvirta, lead analyst for the Center for Research on Energy and Clean Air, a Helsinki-based nonprofit.

"They expect a massive wave of construction after a negative economic shock, and that's what's keeping them churning," he said in an interview Thursday. That was how China responded to the 2008 financial crisis and 2003 SARS epidemic.

In a speech Friday before the annual National People's Congress, Chinese Premier Li Keqiang offered mixed messages to the country's steelmakers.

Li promised stimulus spending equivalent to about 4% of the country's gross domestic product, or GDP. The Chinese Communist Party plans to focus on building out the nation's network of electric vehicle charging stations and water conservation projects, the state-run Xinhua News Agency reported. It will also shovel an additional \$14 billion into national railway development.

But for the first time in more than a quarter century, Beijing declined to set an annual GDP goal for the country — a benchmark that in past years has driven local party officials to prioritize building at any cost.

"Not setting a specific target for economic growth will enable all of us to concentrate on ensuring stability," said Li, the party's second-highest-ranking official, according to Xinhua.

## Bulletin Board

## Curiosities

JUN. 12, 2020

Most of the steel China will use to rebuild its economy likely will be made by using coking coal.

“There has been a progression in the developed world toward more of the scrap steel production,” Fitch’s Bonar said. That process uses lower-emitting electric arc furnaces.

But in the Asia Pacific region, she said, “there has been a build-out of these newer blast furnaces [and] basic oxygen furnaces that do use coking coal.”

In a 2018 report on reducing emissions from industrial sources, the IPCC said “a shift from blast furnace based steelmaking to electric arc furnace steelmaking provides significant negative cost opportunities.” In other words, phasing out the use of coking coal would be a cost-effective way to combat climate change.

Yet climate advocates appear to have done relatively little to target coking coal, which is also known as metallurgical coal.

In Australia, where much of the coking coal consumed by China is mined, Greenpeace put out a [report](#) in 2017 that argued the country’s «continued expansion of metallurgical coal exports is hindering the global uptake of cleaner steelmaking alternatives.»

Yet when E&E News asked Greenpeace Australia about the current state of activism around coking coal, Martin Zavan, a spokesman for the group, declined to provide a comment.

The U.S. is another major producer, with more than a third of its coking coal dug in West Virginia, according to the U.S. Energy Information Administration’s most recent [annual coal report](#).

But the Sierra Club’s “Beyond Coal” campaign primarily focuses on thermal coal,” spokesman Daniel Willis said in an email. “We don’t follow metallurgical coal as closely.” Willis didn’t respond to a follow-up email asking why that’s the case.

**‘We have the good coal’**

At this point, Wall Street still considers coking coal a viable bet — both economically and politically.

For example, when BlackRock Inc. Chairman and CEO Larry Fink announced earlier this year that the world’s largest asset manager is “exiting investments that present a high sustainability-related risk,” he only called out thermal coal ([Greenwire](#), Jan. 14).

## Bulletin Board

## Curiosities

JUN. 12, 2020

Mining companies seem to have gotten the memo. Earlier this month, Arch Coal Inc. dropped the rock from its name.

“Our name change and the new website reflect Arch’s intensifying focus on metallurgical markets and the global steel value chain, which we believe offer superior long-term return opportunities for our shareholders,” Paul Lang, the CEO and president of what’s now known as Arch Resources Inc., said in a press release.

“In combination with iron ore, our metallurgical products are indispensable in the primary production of steel,” he added. “We expect steel to play an essential role in the revitalization of the global economy as it recovers from the disruption of the COVID-19 pandemic, and in the construction of a new economy supported by mass transit systems, wind turbines and electric vehicles.”

Some mining executives have even sought to cast coking coal as a virtuous product.

“We have the good coal, not the bad coal,” Donald Lindsay, the president and CEO of coking coal producer Teck Resources Ltd., said at a Jan. 29 investor conference.

“I’d love to change the name of steelmaking coal to something else so that people could understand that it’s entirely different,” Lindsay said, according to [reporting](#) by S&P Global Market Intelligence.

Experts doubt that Wall Street will cut off funding to coking coal until environmentalists or regulators force them to.

Myllyvirta, who worked for Greenpeace before helping launch the Center for Research on Energy and Clean Air in December, expects pressure to shift to coking coal miners and steelmakers once more coal-fired power plants are taken offline. Coal plants remain a much larger source of global emissions.

“Given the way thermal coal is going, I think there’s also increasing recognition that [coking] coal will need to be a part of the message for the campaigning groups,” he said.

[eenews.net](#), 26 May 2020

<https://www.eenews.net>

# Bulletin Board

## Technical Notes

JUN. 12, 2020

**(NOTE: OPEN YOUR WEB BROWSER AND CLICK ON HEADING TO LINK TO SECTION)**

### CHEMICAL EFFECTS

[A review on the environmental exposure to airborne manganese, biomonitoring, and neurological/neuropsychological outcomes](#)

[Pulmonary toxicity of silver vapours, nanoparticles and fine dusts: a review](#)

### ENVIRONMENTAL RESEARCH

[Occurrence of halogenated pollutants in domestic occupational indoor dust](#)

[Study protocol to examine the relationship between environmental exposure to lead and blood lead levels among children from day-care centres in Ekurhuleni Metropolitan Municipality](#)

[Photodegradation of 1,3,5-Tris-\(2,3-dibromopropyl\)-1,3,5-triazine-2,4,6-trione and Decabromodiphenyl Ethane flame retardants: kinetics, main products, and environmental implications](#)

### PHARMACEUTICAL/TOXICOLOGY

[Instability of urinary excreted methyl-2-acetamido-2-deoxy-1-seleno- \$\beta\$ -d-galactopyranoside \(Selenosugar 1\), the main elimination product of human selenium metabolism, and measures for its stabilisation](#)

[Perfluoroalkyl substances exposure and hearing impairment in US adults](#)

[Associations between essential metals exposure and metabolic syndrome \(MetS\): Exploring the mediating role of systemic inflammation in a general Chinese population](#)

### OCCUPATIONAL

[Benzene exposure-response and risk of lymphoid neoplasms in Chinese workers: A multicenter case-cohort study](#)

[Hexavalent chromium induces mitochondrial dynamics disorder in rat liver by inhibiting AMPK/PGC - 1 \$\alpha\$  signaling pathway](#)