

Virus Under the Microscope

Act Four

A play-within-a-play for teachers, parents and students
about the COVID-19 virus with the introduction and naming of more viruses.

An educational story (a play) that concludes with hope by Robert Hicks

Act Three was completed August 05, 2020. Lab Tech #1 and Lab Tech #2 had been assigned to different labs. Ten days have passed since they have worked together.

As of August 15, 2020, according to the Worldometer.info website:

- World-wide there have been 18,954,433 cases of Coronavirus (COVID-19), an increase of over 2.5 million in the last 10 days, and 766,027 deaths, an increase of 46,000, and 14,243,436 recovered, an increase of 2.1 million.
- In Canada there have been a total of 121,760 cases, an increase of 3,500 in the last 10 days, and 9,021 deaths, an increase of 59, and 108,044 recovered, an increase of 5,271.

The Coronavirus isn't going away:

Students have been out of the classroom for more than five months. The border between Canada and the United States has been closed for 6 months to non-essential cross-border trips and that closer has been extended to September 21, 2020. Federal health officials are preparing for surges in new cases, including an expected peak of the outbreak this fall that could temporarily exceed the ability of the health care system to cope.

COVID-19 testing at Public Health Ontario (PHO) laboratories are performed 7 days a week at locations in Toronto, Hamilton, London, Kingston, Timmins and Ottawa. PHO added additional shifts for testing (nights and weekends), including 24/7 testing at their laboratory in Toronto.

Their testing is an essential component of Ontario's response to COVID-19, not only because it tells us if someone has COVID-19 or not, but also because it sheds light on where and how the virus is spreading.

PHO's laboratories, one of the largest public health laboratory systems in the world, conduct over 6 million tests on a broad range of clinical and environmental samples every year at 11 sites across Ontario. They perform thousands of COVID-19 tests every day in partnership with many hospital, academic and private labs across the province. This network of labs, coordinated by Ontario Health, has come together rapidly since early 2020 in order to meet the increased demand for testing.

They work with the Ministry of Health, Ontario Health and other key experts and stakeholders to monitor, provide guidance, and strategize to make sure COVID-19 testing in the province continues to respond to this evolving public health emergency.

We are thankful for their service in our fight against COVID-19.

Lab Tech #1 and Lab Tech #2 have been working in different labs. Today they meet again. (In the play they enter the stage and sit at a lab table with their microscopes 7 feet apart.)

Lab Tech #1 says, "Greetings, I tap for you four times with goodwill, compassion, respect and justice. How have you been doing with the long hours we have been working?"

Lab Tech #2 says, "Having thousands of samples pouring in every day is a new experience. All Lab Techs have been working hard to process the high volume of tests coming in. It is tiring, but I show up every day. How are you holding up? Oh, by the way, I tap for you four times also. I like our new greeting."

Lab Tech #1 says, "The scale and pace of what we're doing right now is unprecedented; everything is happening so fast, but I am holding up okay. It helps to be able to talk with you about it. I made another slide that I would like to get your feedback on. Would you mind having a look?"

Lab Tech #2 says, "Of course! Your slides are not just educational, they are unique and make me think. I am looking at these viruses like I have never looked at them before."

The Viruses enter the lab. At the end of Act Two they heard and felt the bombs of goodwill, compassion, respect and justice exploding around them. They became weaker but they survived. At the end of Act Three they felt like screaming, but they could not scream – they do not have vocal cords. They felt hot, they started to sweat and their nausea was getting worse. They decided they hated Tech #,1 but they could not leave his side. They are fascinated by the conversation. Although they are getting more nervous by the day, they are back to listen to the Lab Techs again. They want to hear what they will say next.

On stage the viruses are the size of humans, but they are invisible. They think they are big. They think they are tough. They will be shocked when they learn the next virus that will be examined closely under the microscope is much larger than they are. When it walks onto the stage, they almost faint! They see that the virus of Climate Change is the size of the entire stage.

The virus of Climate Change walks onto the stage. It is 8.2m x 8.2m x 8.2m in size (27 feet x 27 feet x 27 feet). It is so big it cannot find a place to sit, so it surrounds everything and everyone on stage and just stands and listens. It can do this because it is invisible like air.

Lab Tech #2 puts his eye on the microscope and reads the following words out loud as the Virus of Climate Change speaks.

Microscope Slide 11

The Virus of Climate Change

I am the Virus of Climate Change. I call myself a virus because:

- Rising global temperatures, coupled with the increasing frequency of extreme weather events, are predicted to cause changes in the seasonality, geography and intensity of infectious diseases.
- The deterioration of air quality that I cause makes people more susceptible to infectious respiratory diseases.
- My floods can enhance the spread of infectious agents like insects, bacteria, and viruses.
- My increasing temperatures and humidity affect the development, survival and spread of not only pathogens but also their hosts (often animals). Mosquitoes and other insects that are carriers of diseases like malaria, dengue fever and the West Nile virus will move to new areas of the planet as they warm up.
- The World Health Organization is reporting on how transmission patterns of infectious diseases will change as a result of me.

I will cause what is described above and more. I am hotter heat waves, drier droughts, larger forest fires, and rising sea levels leading to higher storm surges and more floods. My intense rainstorms will get even more intense, wreaking havoc through flooding and erosion. I will change the oceans, weather, ice, and living systems in countless ways.

With so many changing ocean and atmospheric factors, climate models of me are extremely complex. A supercomputer running a climate model must make trillions of calculations just to simulate a single day of the climate. Yet climate models are surprisingly good at predicting how the climate will change over the course of 10, 20, or 50 years. They can also answer questions, such as what will happen if you emit more, or less CO₂ into the atmosphere.

The science behind why I am changing is straightforward. When people burn fossil fuels to produce electricity, heat, and drive their vehicles, they emit greenhouse gases (GHGs) like carbon dioxide (CO₂) and methane. These gases trap the sun's energy in the earth's atmosphere as heat. As more and more GHGs are released, more heat gets trapped and the planet warms up, disrupting the long-standing, delicate climate systems that have made life on earth possible.

Stronger storms and longer droughts are becoming a dangerous new normal. How these impacts play off each other, is far more nuanced. In many cases, the wildfires or disappearing glaciers you see in the headlines have unseen knock-on effects that lead to more wildfires and disappearing glaciers.

Think of me like dominoes lined up in an infinite spiral – when one dominoe falls, it creates a reaction that pushes over another and then another right down the line. Scientists call this process a “feedback loop” and it will have profound consequences for the planet.

Climate feedback loops are “processes that can either amplify or diminish the effects of climate forcings”. “Forcings” are the initial drivers of your climate, they include solar irradiance, GHG emissions, and airborne particles (dust, smoke, and soot) that come from both human and natural sources and impact climate.

Feedback loops make the impacts of key climate factors stronger or weaker, starting a cyclical chain reaction that repeats again and again.

There are two major categories of climate feedback loops; negative and positive. Negative feedback loops play an integral role in maintaining the atmospheric balance in various systems on earth. One such feedback system is the interaction between solar radiation, cloud cover, and planet temperature that can help stabilize the system and promote a settling to equilibrium. A positive feedback loop however, “accelerates a response and leads to instability via exponential growth”. Using the water vapour cycle as an example, it goes something like this:

- As more and more heat-trapping greenhouse gases are emitted, the atmosphere warms up.
- This warmer air leads to more water evaporating from our oceans, rivers, lakes and land, entering the atmosphere.
- Warmer air holds more water vapour. Water vapour traps heat.
- The extra water vapour in the already warmer air retains even more heat, amplifying the initial warming.
- More warming leads to even more water evaporating, starting the cycle over again and again and again.

It's a vicious cycle! Climate change is causing a cascade of effects that results in even more climate change. It is a problem humanity created. It is taking on a life of its own - to potentially devastating effect!

I am what the United Nations calls the biggest and most urgent threat to mankind. I contribute to insecurities such as; tensions over scarce resources, land loss and border disputes, conflicts over energy sources, conflict prompted by migration, and tensions between those whose emissions caused climate change and those who will suffer the consequences.

I am all about numbers. I am the numbers of science. When people talk about me, it is the numbers that matter; the numbers that deal with the data, the measurements, and the observations from science.

Galileo declared, "The 'great book' of the universe is written in the language of mathematics."

It does not matter what language you speak to understand me, when my numbers can speak to you. In my view, the mathematics of climate change is the music of reason. There is a facing-the-music that math forces, and that's why it's a wonderful language for describing nature and for describing me.

Mathematics reveals hidden patterns that help people understand climate change and the world around them. A broader public understanding of the role of mathematics in mankind's understanding of climate change would allow for a more informed discussion of the issues, and a stronger and more effective societal response. I am a serious threat to your way of life and education using mathematics can play its part in addressing my threat.

You may wonder how anyone can make a prediction about long-term climate change?

The answer is that climate is an average of weather conditions. In the same way that good predictions about the average height of 100 people can be made without knowing the height of any one person, forecasts of climate, years into the future, are feasible without being able to predict the conditions on a particular day. The current challenge is to gather additional data and use numerical methods to extend today's 20-year projections for the next 100 years.

One of the clearest predictions from climate change modelling is warmer temperatures. Almost everywhere in the world will be warmer by 2100, and you will see an increase of extreme heat. The amount of warming will depend mainly on the amount of fossil fuels burned. At this moment in time, humanity is burning far too many fossil fuels. This behaviour is a choice and it is not slowing down fast enough.

The biggest question mark in climate models is the human factor. How will you change your behaviour? How much will you change your use of fossil fuels and the resulting emissions of heat-trapping carbon dioxide?

Climate change mathematics (the music of reason) will support predictions for what will happen as time passes. When the math accurately describes reality, those predictions will be evident through observation. A close collaboration between climate scientists, mathematicians and statisticians can help make these important predictions as helpful to understand as possible.

Just two weeks ago on August 04, 2020 Nasa published a stunning new forecast report made possible by a new computer model from the NASA Sea Level Science Team. There is a new "Python Glacier Evolution Model," or PyGEM, that uses extensive data sets, instead of less detailed estimates from isolated, regional effects or extrapolations based on a small number of glaciers. It is a huge advance compared to previous studies that allows climate scientists to assess changes in glacier mass and runoff at an unprecedented scale.

PyGEM is among the first models of its kind to be made available to the scientific community as an "open source" code – allowing any researcher to plug in data and run the model. As they grow in power and precision, these computer models are playing the music or reason (mathematics) louder than ever and are revealing the intricate dance of climate, ice-melt, and sea-level rise with increasing clarity.

The key to the sweeping new modelling method is its grounding in hard data. The science team studied changes to 95,536 glaciers from 2000-2018, as observed by the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) aboard NASA's Terra satellite. The observations cover nearly every glacier in High Mountain Asia, which covers an area of 98,000-square-kilometres (38,000-square-miles), including those too small to be captured in previous studies. This is truly unprecedented when you consider that a decade ago, global glacier evolution models were relying on data from less than 300 glaciers.

This report (only two weeks old) says the ice in one of the world's highest concentrations of non-polar glaciers could see significant melting before the end of the century, potentially affecting sea levels around the globe. The region, known as High Mountain Asia, could see ice loss run from 29 to 67

percent, depending on the level of greenhouse gas emissions over the period modelled. According to the study, water flow in monsoon-fed river basins, driven largely by melting glaciers, could hit its peak by 2050 – potentially reducing runoff beyond that time and forcing changes in how water is consumed, or forcing communities to find other water sources. That is only 30 years away.

By sheer number, High Mountain Asia accounts for 44 percent of all the glaciers in the world—apart from the Greenland and Antarctic ice sheets—though it accounts for only a fraction of glacial mass. The melting of these glaciers over decades contributes significantly to rapid, and accelerating, global sea-level rise.

Most scientists would agree, when it comes to teasing out the inherent secrets of the universe, nothing visual, verbal or aural comes close to matching the accuracy and economy, the power and elegance, and the inescapable *truth* of the mathematical. Mathematics contribute to mankind's insights into climate change and it can be used to help guide the actions that must be taken to ensure that earth will be a safe and healthy place for mankind to prosper in the year 2100 and beyond.

Until the mathematics of climate change is acknowledged, accepted and confronted, I will continue to be the Godzilla of all viruses. I can walk around the earth crushing cities, crushing farms and sinking islands. My representative on the slide under the microscope weighs one tonne and takes up 8.2 meters x 8.2 meters x 8.2 meters (27 feet x 27 feet x 27 feet) of space in the atmosphere. But I am much larger. I weigh millions of tonnes in your atmosphere and I continue to grow every day. The only thing that can slow me down is the music of reason and what it tells you must be done.

If you keep approving new coal mining projects, I will not slow down, I will speed up.

If you keep building oil and gas pipelines, I will not slow down, I will speed up.

If the planned 1,897km (1,179-mile) Keystone XL pipeline project proceeds to carry 830,000 barrels of oil each day from the oil sands of Alberta, through to Steele City, Nebraska, I will not slow down, I will speed up.

If the Trump administration roll back of the US government's strongest attempt to combat the climate crisis, compelling auto companies to produce more fuel-efficient vehicles, is not reversed, I will not slow down, I will speed up.

The changes to Obama-era regulations will allow vehicles to emit approximately a billion additional tonnes of heat-trapping carbon dioxide into the atmosphere (equivalent to roughly a fifth of annual US emissions). It rolled back a 2012 rule that required automakers' fleets to average about 50 miles per gallon by 2025. Instead, the fleets will now have to average about 40 miles per gallon. This rollback was one of dozens Trump officials have ushered to completion, seeking to bolster the fossil fuel industry.

Methane in the earth's atmosphere is a strong greenhouse gas with a global warming potential (GWP) 84 times greater than CO₂ in a 20-year time frame, yet the Trump administration intends to lift Obama-era controls on methane this month - August 2020.

When the President of the United States does such things, climate scientists know I will flood Florida faster.

When federal, and provincial governments across Canada suspend environmental oversight rules, even temporarily, to grapple with COVID-19, I will not slow down, I will speed up.

In Alberta, Energy Minister Sonya Savage has said the COVID-19 restrictions on gathering sizes mean it's a "good time to build a pipeline". In Ontario, Premier Doug Ford's government suspended a large section of environmental oversight law, saying it could delay response to the pandemic. Under the temporary rules, the government does not have to notify or consult the public about any environment-related changes it makes.

The federal government has delayed implementation of the clean fuel standard from January 2022 until an unspecified date later that year. The clean fuel standard is a major piece of Canada's climate strategy, aiming to reduce the country's carbon emissions by 30 million tonnes per year. With this delay, I will not slow down, I will speed up.

Alberta suspended the requirement for companies operating coal mines to submit annual reports on their plans for the following year, the progress of work at the mine, progress on returning land to a natural state, and work on finding new coal deposits. It also eliminated the requirement for Cabinet to sign off on new oilsands projects. As a result, proposals with Alberta Energy Regulator's approval may go ahead.

Ontario temporarily suspended part two of Ontario's Environmental Bill of Rights, which gives the public a say in actions that affect the environment. When suspended, the government did not have to notify or consult the public on environment-related projects, changes or regulations, so it's not clear what changes may have been made during that period.

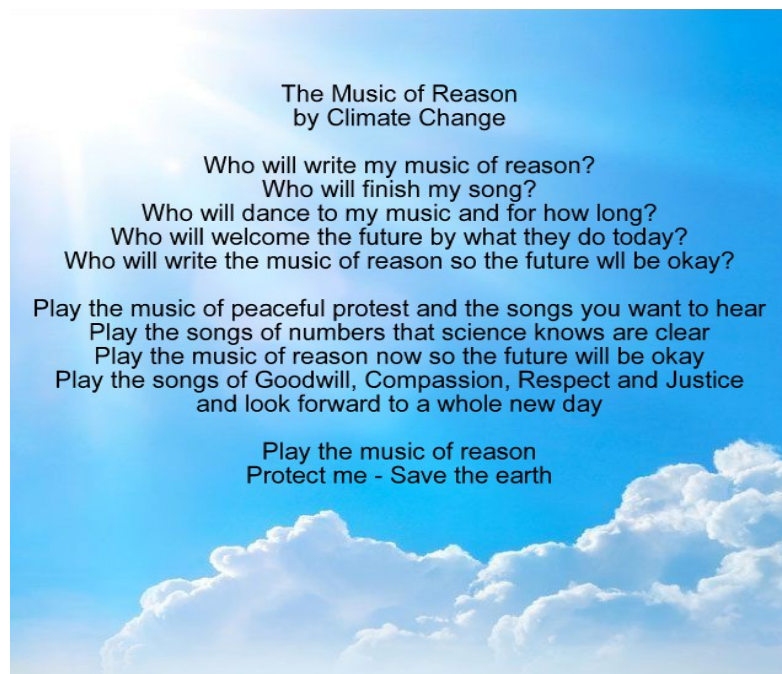
When Canadian governments do such things, climate scientists know I will melt arctic sea ice faster. Rising sea levels are one of the most damaging long-term impacts of the climate crisis, and the consequences to Greenland and Antarctica are accelerating. Including 2020, the linear rate of decline of the July sea ice extent is 7.48 percent per decade, or 70,800 square kilometers (27,300 square miles) per year.

If world leaders keep rolling back hard fought for environmental guidelines, and do not establish and enforce new ones, I will not slow down, I will speed up.

If world leaders keep listening to the music of money, when they should be listening to the music of reason, I will not slow down, I will speed up.

I am already gigantic and the bigger I get, the faster I will destroy humanity. Digest what my "little" representative is trying to say. My "little" representative that is 8.2 meters x 8.2 meters x 8.2 meters in size (27 feet x 27 feet x 27 feet)! Multiply the message billions of times. Do you understand I am a serious problem for you? Does it matter to you?

I am a gigantic virus. I admit I am a gigantic threat to you. What I say next will likely surprise you. I have a heart. I do not like who I am. Unlike all other viruses, I wish you Goodwill, Compassion, Respect and Justice. I want you to have a healthy future. I have written this poem for you.



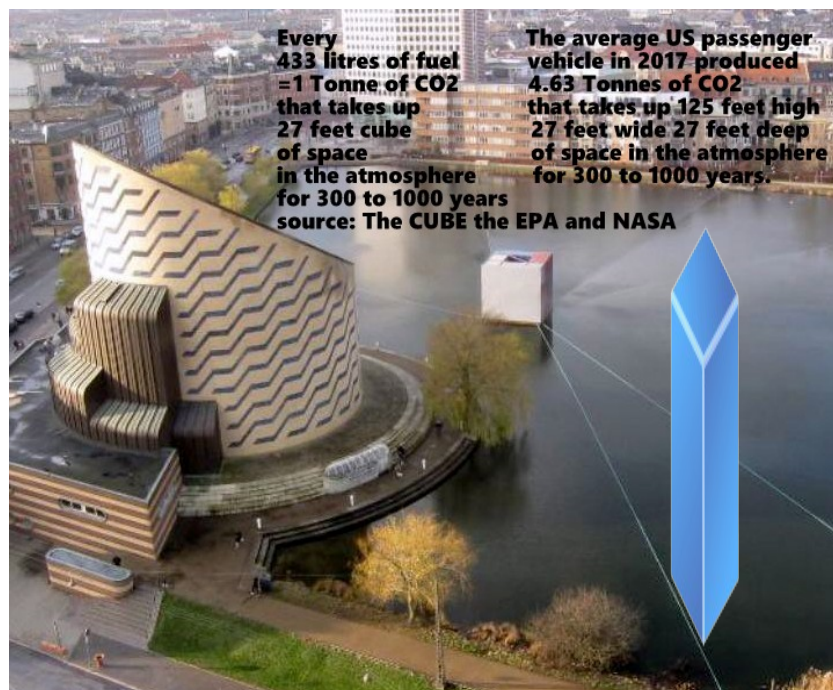
Lab Tech #2 says, "WOW! I don't know what to say. I'm at a loss for words to describe this. I know I should be shocked and frightened, but somehow I feel encouraged by Climate Change claiming that the music of reason can be played today to help us address it. Climate Change is telling us it has a heart and that it cares about us. It is asking us to protect it, while we are thinking we must be protected from it. We feel the same; we both agree. It is asking us to save the earth and telling us how. It is telling us to play the music of reason (the music of mathematics) to identify what is required and act before it is too late.

The Viruses of Racism, Prejudice, Discrimination, Bullying, Bigotry, RPDBB-20, Societal Indifference, Police Brutality, the Virus of Inaction and the COVID-19 Virus are staring in awe of this virus. They are impressed. Are they learning something about themselves? They are wondering how the Virus of Climate Change got a heart. Each one is questioning if they have a heart. If they have a heart hidden deep inside them. They are confused, but they are intrigued.

Lab Tech #1 says, "Yes, I understand what you are saying. I was amazed when I saw this virus under the microscope. It was like Climate Change was speaking directly to me. I did not expect it. It described itself so powerfully, in such detail. I have not heard climate change described like that before. It was very poetic! I'm very impressed.

When I first saw this slide, I paused. I wasn't sure what to think and how to react. Then I realized what "little" representative of Climate Change meant. It was talking about 1 tonne of greenhouse gas.

This photo illustrates what 1 tonne of CO₂ GHG looks like as it enters our atmosphere and it stays there for approximately 300 to 1000 years!"



The Music of Reason:

This cube representing 1 tonne of CO₂ in a physical form is floating in St. Jorgens Lake in Copenhagen beside the Tycho Brache Planetarium. The Cube - the size of a three-story building 8.2 meters x 8.2 meters x 8.2 meters (27 x 27 x 27 feet) visualized 1 metric tonne of invisible gas. It was meant to visualize the seriousness of global warming and climate change.

It was placed there with the support of the United Nations organizers of the UN Framework Convention on Climate Change (UNFCCC) COP15 held in December 2009 to show the participants at Copenhagen's Bella Center (15,000 delegates and 110 heads of state from 192 nations) what a tonne of CO2 greenhouse gas looks like as a physical form in our atmosphere.

The designers of this “architectural feat” were the Italian born Danish Sculpture Alfio Bonanno, a pioneer of site-specific nature installations, and Los Angeles based architect Christophe Cornubert, recipient of the Rietveld Architecture Prize. They did a brilliant job. Unfortunately, based on the lack of action to address climate change in the last 11 years, it wasn't brilliant enough to drive the point home into the minds of conference participants and world leaders.

It might have been helpful if they placed another cube 38 meters (125 feet) high, about the size of a 9 story building beside it, to show the amount of CO2 the EPA says the average American passenger vehicle sent into the atmosphere in the year 2017. I enhanced the photo to show the 38 meters (close to scale).

It also might have been helpful if beside the 27' cube of CO2 gas, they placed the tiny 30” square cube of 433 liquid litres of fuel burned to produce the one tonne. The amount of fuel to produce 4.63 tonnes, the average American vehicle burned in 2017, would only take up a space 30 inches x 30 inches x 12 feet. This is simple mathematics and another example of the music of reason.



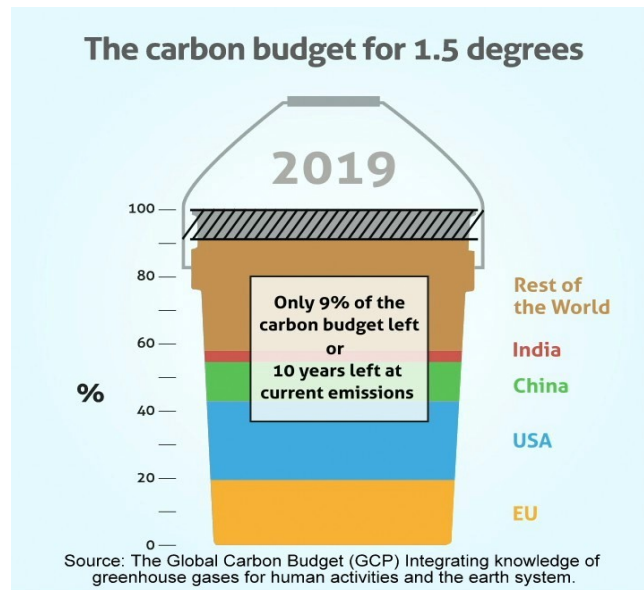
CO2 CUBE, COP15 Installation. Copenhagen, 2009

The Music of Reason:

This is not fake news. This is a good example of why the parts per million of CO2 in the atmosphere is reaching the tipping point beyond which we will have runaway climate change. There is only 9% of the carbon budget left. The bucket is almost full. If we overflow the bucket we will go beyond the 1.5 degree warming benchmark. About 10 years at our current emissions rates. Time is up.

These numbers, the 433 litres of fuel burned for every 1 tonne, have been successfully hidden from people all over the world. In new car showrooms in every country, instead of talking about how many kilometres or miles a vehicle can drive before it sends one tonne of CO2 into the atmosphere, the oil industry and the auto industry have ensured that car dealerships only talk about the grams of CO2 a vehicle produces per kilometre. The numbers will produce the same results, but grams of CO2 are numbers so small people cannot visualize them. They are viewed as insignificant. The tinniest numbers possible related to CO2 have been the oil industries music of money for a long time. They know the more the world ignores these numbers the more money they will make in the future, even though that future will be shortened by climate change

When people look at the photo showing the 1 tonne cube of CO₂ and consider there is currently over 1 billion vehicles driving on earth every day, it may help drive home the point. This cube should be on display in every country, in every city, to help explain why we must replace the billion fuel-filled vehicles with electric powered vehicles as fast as possible. It highlights why governments must replace new and proposed coal and pipeline projects, with sustainable forms of energy.



The Music of Reason:

Understanding the observed magnitudes and patterns of the factors influencing global CO₂ emissions is a prerequisite for the prediction of future climate and earth system changes, and for human governance of climate change and the earth system. Although the requirements for understanding and governance have been emerging for decades, it is finally accepted that climate change is an urgent challenge requiring globally concerted action.

Scientific insights over the last several years have shown that it is the cumulative CO₂ emissions (sum total of all emissions over time) that primarily determine peak (maximum) human-induced warming.

The Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC) is to hold the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to “1.5°C” above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change. (UNFCCC, 2015)

Sadly, world leaders are not acting. The strong global fossil-fuel emissions growth since 2000 has identified that no region is decarbonizing its energy supply. Instead of listening to the music of reason, the powerful energy sector and world leaders are listening to the music of money.

Continuous decreases in CO₂ are postulated (a statement that is taken to be “true”, to serve as a starting point for further argument) in all IPCC emissions scenarios to 2100, so that the predicted rate of global emissions growth is less than the economic growth rate. Without these postulated decreases, predicted emissions over the coming century would be several times greater than those from current emissions scenarios.

In the unfolding reality since 2000, the global average growth of CO₂ has increased and there has not been a compensating faster decrease. This means that even the more fossil-fuel-intensive IPCC scenarios underestimated actual emissions growth during this period.

A long-term (multi-decadal) perspective on emissions is essential because of the long atmospheric residence time of CO₂. The length of time CO₂ stays in the atmosphere is not certain. Estimates of the characteristic 'residence time' of a molecule of carbon dioxide in the atmosphere involve a complicated mixture of factors, leading to different conclusions.

Some say that about 50% of a CO₂ increase will be removed from the atmosphere within 30 years, and a further 30% will be removed within a few centuries. The remaining 20% may stay in the atmosphere for thousands of years. Others say 50-200 years, and no single lifetime can be defined for CO₂ because of the different rates of uptake by different removal processes.

Nasa says once carbon dioxide is added to the atmosphere, it hangs around between 300 to 1,000 years and as humans change the atmosphere by emitting carbon dioxide, those changes will endure on the timescale of many human lives.

The EPA says carbon dioxide's lifetime cannot be represented with a single value because the gas is not destroyed over time, but instead moves among different parts of the ocean-atmosphere-land system. Some of the excess carbon dioxide is absorbed quickly (for example, by the ocean surface), but some will remain in the atmosphere for thousands of years, due in part to the very slow process by which carbon is transferred to ocean sediments.

The bottom line is that if one is forced to simplify reality into a single number for popular discussion, several hundred years is a sensible number to choose, because it tells three-quarters of the story, and the part of the story which applies to our own lifetimes. Several hundred years is 'forever', as it is long enough for ice sheets to respond and melt and for extreme weather to plague many generations.

This means the music of reason - the music of mathematics - the music of climate change, must be played LOUDER.

COVID-19 has taught us we are all in this together. There is a considerable amount of positive energy throughout the world, near and far, addressing a need to take care of each other and identifying how we can take care of each other.

It may seem as if the world is in turmoil with no hope for dialogue and resolution, but youth (super-people) are going to protest in the streets in the months and years ahead to say that is not so. They are hopeful and they are going to warrior up and demand it.

This leads to the following important questions:

- How quickly can we implement policies that decarbonize the economy and produce an economy that sustainably reduces and compensates the emissions of carbon dioxide (CO₂)? Why is the UN failing to make this happen?
- How quickly can we stop our manic land clearing? Why do we allow this to continue?
- How quickly can we end the burning of coal for energy, because the long-term goal must be to create a CO₂ free global economy and to return to levels of CO₂ naturally present in the atmosphere prior to human intervention? How quickly can we enforce the far more ambitious policies needed to achieve the global target (enshrined in the 2015 Paris climate agreement) of net-zero emissions by 2050. Why is this not happening?
- Why did China approve five new coal-fired power plants in March 2020?
- Why are Australia Federal and State governments pushing for the expansion of coal mines, and why are their coal projects proceeding? Why has Australia officially become the world's largest exporter of liquefied natural gas on an annualized basis edging out the former number one exported title holder Qatar?
- Why is the US rolling back emission standards for cars? Why is the contentious Keystone XL oil pipeline to the United States proceeding?

- Why are fossil fuel-based industries intensively lobbying for their future, pressuring governments to adopt policies and interventions that favour them but not the climate? Why are governments not rejecting these pressures?

The answer to all questions above is the music of money. If we want to provide youth with a livable, sustainable world, music of money must be replaced by the music of reason! For our youth, it is a matter of existence. They will fight for it. They will play the music of reason, protect climate change and save the earth!

On stage the virus' confusion escalates. They have each been wondering if they have a heart. They are questioning if they should be dancing to the music of reason or the music of money. They are contemplating sticking to the 'status quo'; their current status, the way they presently are. They realize time is running out and change is imminent. They are wondering how this change will affect them.

Tech # 2 says, "How can we fight this? Who will fight this?"

Tech # 1 says, "The answer to that is youth, I call them super-people. Complacent describes someone that is generally satisfied with conditions and too comfortable to complain or make a fuss. Complacent is the opposite of our youth. Today's youth will not be complicit about climate change, they will not contribute to it, and they will not cover it up.

Greta Thunberg launched the FridaysforFuture movement to spark global protests and denounced a lack of government action to cut heat-trapping emissions before it is too late. She said to the United Nations,

"So, we are now in a new year and we have entered a new decade and so far, during this decade, we have seen no sign whatsoever that real climate action is coming and that has to change. To the world leaders and those in power, I would like to say that you have not seen anything yet. You have not seen the last of us, we can assure you that. We are an alliance that is organizing in 20 countries to say: 'time is up!'"

Greta's Canadian counterpart Autumn Peltier is also saying "it is time to worrier up". That is what millions of youth are doing. They refuse to be complicit in the destruction of their own futures. Millions of protesters are going to play the music of reason faster than a streak of lightning, more powerfully than the pounding surf, and louder than a roaring hurricane in demanding the fundamental societal change that is required to improve the health of our planet.

Time is up for environmental justice; the music of reason has made that very clear. Likewise, time is up for racial justice; Black Lives Matter protests have made that very clear. Both are linked to justice and justice matters.

People throughout the world are becoming very passionate about justice. This will be the decade of passion delivered through protest.

Protesting is the time-honoured practice of publicly speaking out against perceived injustices and urging action. While there is a right to peaceful protest, 'peaceful' being the operative word, there are limits. Canada is a 'country of the rule of law' and rights are subject to limits. Determining what the limits are, and whether they are reasonable or not is often debatable. Society is constantly trying to balance those rights.

Protests can take the form of marches, sit-ins, boycotts, and include speeches, music, chanting, performance art, poetry, symbols, signs, confronting people, assembling near symbols and/or in places of significance to the cause or occupying a specific building or space.

Protests are among the many strategies people use to engage in activism and organizing with the goal of enacting change. Other ways to engage in activism include advocacy for legislation, public awareness campaigns, raising funds, gaining support through social media, among others.

Non-violent resistance (also called civil disobedience) is another form of protest. This type of protest is characterized by people engaging in a symbolic protest or peacefully refusing to cooperate; like the sit-ins that began in 1960 as part of the Civil Rights Movement.

The late civil rights leader, John Lewis, US Representative (D-Ga.), has referred to protests as 'good trouble'. I think we will likely see a lot of that in the months and years ahead.

The decade of passion. That reminds me, my sister wrote a letter to Global Climate on behalf of humanity. It is heart felt. I think a lot of people feel the same way, but life is busy, and many don't think about climate; they take it for granted. It shouldn't be that way."

The viruses look at each other. More poetry, why more poetry? Poetry makes them nervous. They can't understand why humans express themselves in this strange way (words expressed eloquently; their meaning felt deeply converting feelings into passions). They would much rather deal with complacent, demotivated humans that they can continue to manipulate. A look of confusion is evident on the virus' faces. Is it possible? The words; the music of reason; the possibility that a heart exists within them?

A letter written to Global Climate
by Carol Fentiman

Hello Beautiful,

I share my life with you
I don't tell you how much I appreciate you
It shouldn't be that way


I am thankful for you
You are irreplaceable

You are important to me
You are nurturing

I can't live without you
I need you

You are the ray of sunshine that keeps me warm
You are the morning dew that gently blankets nature
You are the raindrops that create puddles to splash in
You are the snowflakes that make snow angels possible
You are the breeze that tosses my hair like a supermodel
You are the clouds that form imaginary characters
You are the howling winds that rustle the leaves
You are the oxygen that fills my heart with joy
You are the lightning that reminds me how powerful you are
You are the thunder that roars, I am here for you, please take care of me

I will do everything I can to protect you
You are my world and I think the world of you

Sincerely,
Humanity 



Tech # 2 says, "That is a beautiful poem. The words are beautiful. I mean, when you really think about it, our climate IS irreplaceable. It is so important! I love the way she describes so many things that I and so many others have experienced. We take it for granted. It shouldn't be that way."

Tech # 1 says, "Yes my sister is talented, and I'm proud of her. Remember she wrote the I Tap For You poem too. That poem was written for our new greeting gesture; a tap of four fingers four times over the heart to wish each other Goodwill, Compassion, Respect and Justice. My sister and I use that greeting all the time and we hope others will too.

As always, I enjoyed our discussion. I have never seen Climate Change described this way before. It leaves me with a lot to think about. The next time we meet I would like to document our findings. The conclusion is surprising. It is powerful. I promise I will give you hope."

Tech # 2 says, "I'm looking forward to it. Next week I will introduce you to a new member of our team, Lab Tech #3, she is a brilliant technologist. Before we meet, I will update her on our discussions. We must take action to address the viruses. I think she can help us."

Tech # 1 says, "Great! I look forward to meeting her. Until next week, I tap my heart for you with four fingers to wish you Goodwill, Compassion, Respect and Justice!"

Tech # 2 says, "And I tap four times for you also. See you then!"

The viruses all look at each other again. They wonder what the other viruses are thinking. They wonder if they are all thinking the same thing.

End of Act 4

Act 5 will follow soon. It will be my last Act.

It will include a short true story. It will surprise you. Watch for it.

Robert Hicks

Canadian Peace Activist – Climate Activist – Poet