



## International Biodeterioration & Biodegradation Society



International Microorganism Day 2020

17 September

### Microbiology Poems

by IBBS members

introduced by a **commentary by Sam Illingworth**

Senior Lecturer in Science Communication at the University of Western Australia

We have  
a map of the universe  
for microbes,  
we have  
a map of a microbe  
for the universe.

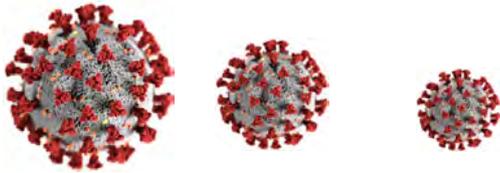
*Mirsolav Holub – 'Wings'*

Poetry is perhaps not the most obvious medium through which to describe the biodegradation and biodeterioration of commercially important materials. However, as evidenced by this short extract from a poem by the Czech immunologist and poet Miroslav Holub, poetry provides an investigatory lens through which we can analyse, re-consider, and crucially poke fun at science.

Ever since the notion of a 'scientist' was first formalised by William Whewell in the early nineteenth century (and indeed long before then), scientists have written poetry alongside their scientific research. Whether this is the experiments in poetic aesthetics conducted by Humphry Davy in his investigations into the medical powers of nitrous oxide, or the verses that Ronald Ross wrote to first capture his observations that mosquitos were a vector for malaria. Poetry affords us an opportunity to think about our research in abstract terms; it also provides fresh eyes to help us devise new solutions to old problems.

Science and poetry are not mutually exclusive entities, rather they offer a complementary way of trying to understand the world and our impact upon it. In reading the poems that feature in this newsletter, consider the ways in which they interrogate and cause you to reflect on your own research and fields of expertise. And then challenge yourself to write your own, you might be surprised to find where they lead...

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### Coronavirus cracker

*Jimmy Walker*

The planes are evident by their absence  
 Long ago noticeable by their contrails  
 That for now are consigned to history  
 Vast volumes of cars no longer troll the roads  
 Death and destruction devastated at the stroke of time.  
 The noise of the odd vehicle is now interspersed  
 By natural sounds once drummed out by the engine and  
 tyre noise.  
 Now the birds sing and their songs can be heard.  
 Calling, mating, a tune in the background.  
 Now listened to by so many.  
 Who before were unable to hear the lullabies.  
 Even the pigeons roosting in the trees  
 Appear to have a loud cooing, a cooing that  
 Not so long ago could not be heard  
 Due to the constant noise instead of which there is now a  
 stillness,  
 A peacefulness that is a result of lock down due to  
 coronavirus.  
 But stuck at home many are listless.  
 Their feet are itchy, they are anxious and champing at the  
 bit.  
 Wanting to be let off the leash.  
 To run free and give someone a cuddle  
 But for now they must remain.  
 Relaxing the lock down will risk lives,  
 Will introduce others to the virus and spread it wide.  
 Leading to further deaths.  
 So for now my friend.  
 Remain still and calm your itchy feet.  
 Be patient, behave, breath in and out.  
 Maintain your social distancing and wash your hands.



### It's in the Air

*Jimmy Walker*

It's in the droplets, it's in the air,  
 A droplet is a droplet is a droplet.  
 How long will that droplet hang around?  
 A second, a minute, an hour?  
 If that droplet is an aerosol then it may  
 Hang around for much longer,  
 Maybe even for hours and hours.  
 Wafting around, moving in the current.  
 Waiting to come into contact with someone.  
 Perhaps just as they breathe in,  
 Taking that small aerosol particle way down  
 Deep into their lungs.  
 That aerosol does not know if it is smaller or larger  
 than 5µm.  
 A scientific differentiation that no one has told the virus  
 about.  
 And these larger aerosols, or are they droplets?  
 They will drop out, all at different rates.  
 Dropping or settling on surfaces in a gradation of time.  
 Surviving and still being infectious for days.  
 Landing on you and the surfaces all around you,  
 Including your face, your hands, your clothes, your hair  
 and your beard.  
 You use those hands for all sorts of things.  
 You touch, hold and contaminate things with those  
 hands.  
 You have thoughts and you bring your fingers to your  
 lips.  
 A natural gesture, in thought as you touch your lips,  
 Pick your nose, rub your eye and run your hand  
 through your beard.  
 Inadvertently the virus in those droplets on your fingers  
 or hands  
 Are given a way round and passed your defences  
 And your impenetrable skin.  
 In through your mouth, your nose, your eyes into your  
 body  
 Invading your cells and attacking your immune system.  
 Waiting to take away your sense of taste and smell.  
 You should have washed your hands.  
 Simple soap and water, how simple can it be.  
 You should have followed government advice.  
 It might not yet be too late, your body may be strong.  
 The virus knows no borders, nor whose country it  
 invades.  
 You may be rich, you may be powerful.  
 The virus does not discriminate.  
 Does not know rich from poor, medic from patient,  
 Royalty from homeless.  
 No one tells the virus whom it can or cannot infect.  
 The cunning culling coronavirus, curtailing our freedom  
 And taking away our loved one.  
 Taking away our last chance to say goodbye.





**Life will never be the same**

*Jimmy Walker*

Life will never be the same  
 70, you can't be 70,  
 Well 70 I am  
 Now on my own I am  
 Socially isolated, a social outcast  
 Sent to Coventry  
 But I don't know if I need to go today  
 Or at the weekend  
 What do they mean from the weekend  
 The guidance is not clear  
 The guidance is vague  
 Is that Friday, Saturday or Sunday?  
 Is it noon, is it midnight?  
 I will have to walk on my own  
 I will have to cycle on my own  
 Stay back, stay away, get back 2m  
 Yes 2m get right back, don't come close  
 Life will never be the same.

**The Virus**

*Jimmy Walker*

A quiet street  
 There is no one there  
 No one shopping  
 No one on the bus  
 Businesses are empty  
 The phones are busy  
 Whats app is in meltdown  
 Twitter is screaming red hot  
 Skype is on its limits  
 The kids are at home  
 Cos the schools are all closed  
 Ocada is unbookable  
 Deliveroo is not delivering  
 The pub landlord is pulling a pint  
 But that is only for them  
 Everyone is at home  
 Too scared to go out.



**Panic, Panic, Panic**

*Jimmy Walker*

We have no bog roll  
 The sanitiser shelves are bare  
 Run, run, the virus is coming  
 Empty shelves, everyone stockpiling  
 My shelves are full, so stuff you lot  
 I am the bog roll king  
 Yet this is a virus that gives you a cold  
 Not a virus that gives you diarrhoea  
 Panic, Panic, Panic  
 I must get to the shops before the shelves are empty  
 I just might need to self isolate for a whole 14 days  
 Now where did I put all that bog roll  
 Empty shelves, panic buying  
 Bullies exerting their strengths in different ways  
 Run, run, the virus is coming  
 Panic, Panic, Panic  
 Panic, Panic, Panic  
 The virus is coming  
 I need all my soaps  
 I need all my bog rolls  
 I am well kitted out  
 Me, I am okay,  
 You, who are you  
 I don't care about you.



**Those pesky bugs**

*Jimmy Walker*

We are so big and so powerful but so often we are not in control  
 The little things in life come back to haunt us.  
 When we let our guard down those pesky little bacteria surprise us  
 with their ferocity.  
 Small preterm babies, ill patients, not feeling well, being  
 immunocompromised are the ones at risk.  
 Just when we thought the water was safe to use the bacterial  
 biofilm grows in silence  
 Releasing their bombs in the form of sessile free floating  
 microorganisms.  
 Ready to come into contact with the most vulnerable in the ward.  
 Flowing out the taps at maximum velocity contaminating the sink  
 and surrounding area,  
 Into the drain they set up an unlimited recontamination stream.  
 Trained cleaners with cloths, fastidiously trying to remove the  
 bacterial contamination and biofilm,  
 Are not equipped to deal with these little terrors.  
 The biofilm hanging like stalactites from the outlet fitting is  
 persistent beyond our wildest imagination.  
 Our patients are at the mercy of those pesky little bugs for in more  
 ways than one we are defenceless and outnumbered.



**Were you depending on someone?**

*Jimmy Walker*



The peak has passed  
 But the mountain is still to be conquered.  
 Hospitals full of covid patients.  
 Seriously ill and facing death like 759 others yesterday.  
 Without the touch and closeness of loved ones,  
 Kept at a distance so far away that social distancing  
 Does not apply  
 For those that live there is the loving care by healthcare  
 Professionals stressed, pressurised with their backs against  
 the wall  
 Dealing with the never, never situation  
 Which this time is not to do with harm to patients  
 But playing Russian Roulette with their PPE  
 Is this situation high enough risk that  
 I want to wear my FFP3 mask if there is  
 An aerosol generating procedure.  
 Or will we contravene all your training  
 And instead of discarding your single use PPE  
 Retaining it and reprocessing it for another day.  
 Someone has let the side down  
 Someone should have looked ahead  
 Someone should have been planning  
 Someone should have been doing their job  
 With NHS staff putting their life on the line  
 They are depending on someone.

**This is me**

*Chris Gaylarde*

I float, I fly  
 As free as air.  
 I can gain entry anywhere.  
 You don't see me.

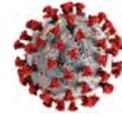
I cross borders;  
 I break barriers.  
 Me and mine, you carry us.  
 No stopping me.

Pick me up,  
 Or pass me instead.  
 No matter, I'm already dead.  
 I'm waiting for you.

You'll make me live.  
 I'll keep you to myself.  
 "But what" you ask, "what if..  
 when I bring friends, you tire us?"  
 Smiling, I say "No problem, host, I'm  
 virus".

**This time**

*Antonio Portugal*



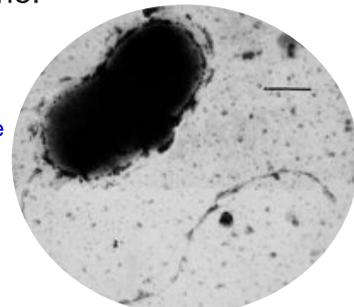
In this time of pandemic and lockdown  
 Our souls are feeling very down  
 But thinking of Biodeterioration  
 is giving us a strong motivation.

**Guess who? (with apologies to John Masefield)**

*Chris Gaylarde*

Dirty, black and smelly,  
 With an iron-caked membrane,  
 Butting through the steel stacks in the  
 benthic slime,  
 With an enzyme for breathing,  
 sulfurizing, rusting,  
 Eating through the metal of the oil  
 pipeline.

Electron microscope  
 image of *Desulfovibrio*



**Wonderment**

*Chris Gaylarde*

The sinuous curves,  
 winding, twisting,  
 I look, I marvel,  
 my pupils lock.

And now by twirling  
 a string appears,  
 the green pearl chain  
 of a pure Nostoc.

And winding more  
 until a ball  
 forms 'neath my eyes.  
 What have I seen?

An alga? No!  
 The helix's bare.  
 The cell's aware  
 it's just, just simply, a blue-green.



**Biodeteriogen life**  
*Maria Iasmira Moza*

We struggle a lot to be  
Whatever the substrate affords  
No one believe us how much effort  
And struggling that could be

Even if you are a fungi  
A lichen, moss or bacteria  
There are different survival criteria  
And no one in our place could be

Sometimes is nice  
When we are many  
We can even watch a film  
Actually forming a biofilm

I personally prefer cyanobacteria  
Me being a small round bacteria  
Since they are the oldest  
And populate all kinds of substrate

They even allow me to stay in their EPS  
And I love that so much  
They kept high the humidity  
So my cell can multiply

Sometimes in winter  
I also love moulds  
They grow so enormous  
And can form snow globes

My life could be sometimes hard  
When people don't like hard work  
And try to kill me with biocide  
Sometimes make me form protective suicide

Bacteria spores are a good way  
To keeps us safe but without energy  
Till all my friends gathered again  
And help me germinate in high humidity

My life is short you can affirm  
But happy in a biofilm  
We can even have different colours  
Or moving promoters

We pose also genetics mechanism  
Bacteria we will says huh?  
I know that we are so small  
But killers anyways!

So do not give us biocide  
Is not our fault you know?  
That this nonconformist covid  
Decide to walk outside

I hope that you are convinced  
That even if we biodeteriorate  
We are somehow forced  
Being our simple way to survive!

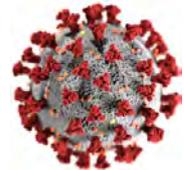
And please forgive my cousins  
Yeah, those nasty pathogens  
They like to form films  
In human blood or lungs

And remember always my aunties  
The ones that live inside you  
More exactly in our intestines  
And help you not to feel blue

I also wish I could be able to write  
Me, an unschooled bacteria  
In order to expose all my biofilm stories  
To make you wish to become yourself a  
bacteria!

**It's only a virus**  
*Jimmy Walker*

It's a virus, it's a virus  
 Run, run it's coming  
 Put on your facemask  
 Put on your facemask  
 But it's a virus  
 It's smaller than the pores in your facemask  
 It won't stop you getting the virus  
 Put on your facemask  
 Put on your facemask  
 The BBC record is broken  
 It just keeps going round and round  
 The virus is coming  
 The virus is coming  
 We are all going to die  
 But it won't feel like a cold  
 You might even think that you have flu  
 Put on your facemask  
 Put on your facemask  
 It really will make no difference  
 The majority will just get better  
 And there will be less deaths than with flu  
 The virus is coming  
 The virus is coming  
 And then it will all be gone  
 And someday life will be normal again



A rock at Skara Brae on Orkney - "ancient lichen tell their story"  
 (see: <http://www.orkneyjar.com/history/skarabrae/>)  
 credits: Johanna Verran



### Intrusive

*Flavia Pinzari*

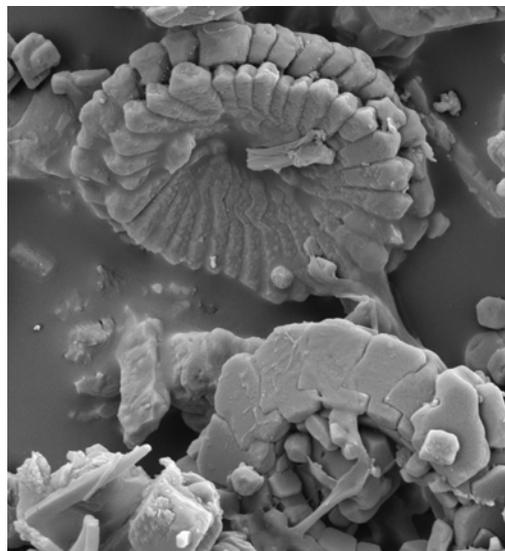
I am spreading  
 the painting is fading,  
 I am breathing  
 searching for water,  
 I am living  
 marching for fiber,  
 I am hoping  
 my enzymes go deeper  
 striving to reach the sugar  
 I miss,  
 I am leaching your feelings  
 persuading your art will not  
 last

### Piscina 1

*Matthew Beesley*

Double-piscina niched and canopied,  
 Bell finial tips spring-filigreed,  
 Votive offerings seep the surge,  
 Of diurnal tides recessed to merge.  
 Chlorella verdant, spirulina blue,  
 Blood green nucleated algal hue,  
 Waters brine or fresh, the stones perspire  
 Gilded sulphide beads, a kindled pyre.  
 Sea polychrome dried, now swathed,  
 With chalk the coccoliths displayed,  
 Each grain a polarising cross to bear,  
 Assemblages as body and soul where,  
 Water, oil and ash, life restored,  
 Vortexed through the drain-hole poured.  
 Abide, proceed, return: the piscina healed,  
 Symbiose of light and form, her refuge sealed.

*Fragments of coccoliths in gypsum  
(SEM image by F.Pinzari)*



**Explanation:** The poem refers to an early medieval stone piscina, manufactured from clunch stone, notorious for iron pyrites decay. It intimates at the anaerobic bacteria reducing seawater sulphates to sulphide, then reacting with iron to form pyrite, in marine sediments during a regressive sea environment. So, sulphate-reducing bacteria, decaying organic matter, anoxic conditions, permineralization replacement, re-introduction of calcite in the form initially of nano-lime solutions as treatment to consolidate, and create coccoliths as biomineralization processes, particularly the crosses on individual grains of coccoliths under PLM.

The poetic imagery shifts from decay to revival, implying the transformation of living organisms, metamorphosis to 'fools gold' pyrites, while also restoring the function of the piscina, as a vehicle to discard Holy Communion water, oil and ashes through the piscina's drain hole, for continued uses, as a symbiosis.

### Haikus

*Hans-Curt Flemming*

microbially influenced  
 corrosion:  
 so many researchers  
 barking up so wrong  
 trees

*Hans-Curt Flemming*

biodeterioration  
 a word  
 like an accident

*Corrada Geraci*

Dark patina  
 lets out  
 a ray of light

*Chris Gaylarde*

Oceans are dying  
 biofilms can help us  
 saving the planet



## Dry Rot is only a Displaced Forest Fungus

*Sarah Watkinson*

Imagine the time when it was an unknown plague:  
you'd go down into your damp cellar for wine  
and the ladder would crumble, your foot in space,  
wine racks draped in a duvet of fungal  
candyfloss,

and when you went back into your front room  
you'd notice the floor would have buckled oddly  
under the carpet; which itself, cotton-backed  
would fall apart in dark shreds as you lifted it.

Later, you would hear of other afflicted buildings  
and how the source of it all was mysterious  
the outbreaks seemingly quite random across  
town;  
was it spread, perhaps, by workmen's tools?

O why is wet cellulose a meal for fungi  
and not for us? How we'd enjoy snacking  
on moist kitchen roll, and the Sunday lunch  
of an untreated whole softwood plank!

We fear rot, but it never meant us harm –  
old dweller in cool northern forests of conifers  
on rainy crags. Involuntary stowaway in timbers  
destined for distant cities, it survived strange  
times

in dockyard stacks – then found a kind of home  
wherever rain got in and stayed - on dewy walls,  
behind the panels of closed-up conventicles -  
were feasts of pine, moist as in Fennoscandia\*.

(\*For explanation, see Watkinson & Eastwood,  
2012, *Advances in Applied Microbiology*)



## Doggerels and Limericks

### Chewing

*Chris Gaylarde*

There was a young bug from Brazil,  
Who said, "I'll not make you all ill.  
I'll stay in this table  
As long as I'm able  
And pile up the frass in a hill".

### Armies

*Chris Gaylarde*

The military might of the termite  
Is a wonderful sight to behold.  
While guarding the workers the whole night  
They're marching, or so I am told,  
In uniform files to-and-froing from piles  
Or mounds, where they cultivate mould.

### Corrosion

*Fred Passman*

We once thought that sulfate reducers  
Were the only corrosion inducers.  
We chose to ignore fermenters galore,  
And their role as acid producers.

### Fuel

*Fred Passman*

If you find many bugs in your fuel,  
And choose to dismiss them, you're a fool.  
Be mindful that dormants  
Can quickly become torments  
When they move from stasis to solid bases.

### My favorites

*Irene Davidova*

Some pretty bacterial girls  
Are hungry for smelly oil swirls  
They would swim a great distance  
And chew them in instance  
Those magnificent bacterial dolls!

### Leather

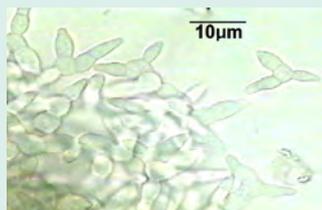
*Pete Askew*

A group of young boffins together  
Tried to stop the rotting of leather.  
After decades of working  
(And a fair bit of drinking),  
They gave up and just blamed the  
weather.

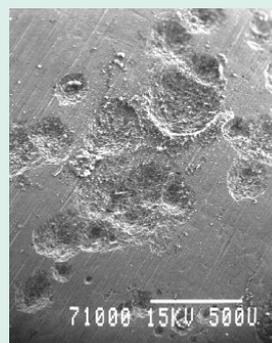
### Plastic

*Robbie Coffin*

We work to protect plastic  
As a material it is quite fantastic,  
But it's filling our oceans,  
From all sorts of potions;  
We must do something drastic!



*Tripospermum from a plastic chair*



Acid corrosion (SEM)