

ELEGY FOR THE ARCTIC by Ludovico Einaudi for Greenpeace

SIGFRIDO RANUCCI IN THE STUDIO

That was the wonderful Einaudi, playing as the polar cap shattered behind him. We might also choose to follow the example of *Novecento*, of Danny Boodman, the pianist who chose to play on while they sank his ship. Talking about a planetwide crisis doesn't seem to attract a lot of attention. That's because even if we're talking about our survival, we have the idea that we're not involved. It's like when you know in wartime that a fighter-bomber is about to fly over and can drop a bomb on you, so you switch the light off to conceal yourself; it's different if the bombing is happening on the other side of the ocean: you don't feel that it's a danger to you as well. You don't feel that personal behaviour can increase winds of 50 km/h, produce a polar vortex and make Chicago colder than Antarctica. But globalisation forces us to consider what physics calls the butterfly effect: the light flap of a wing can move air molecules that then move others in their turn, to the point of producing a hurricane thousands of miles away. Today's virus is forcing us to re-evaluate our relationship with the planet. Could pollution facilitate infection, for example? The scientific debate is ongoing. It's serious. And if that's how it is, fine: it's better to know that we're in the sh*t. I hope you'll pardon the vulgarity of the metaphor but, as you'll see, it's not really a metaphor. Over to Luca Chianca.

WE'RE IN THE SH...

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LUCA CHIANCA

Why all this care and attention when you go inside?

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

For hygiene reasons; all it takes is for someone to come from another farm and they can bring viruses or bacteria that can infect or cause illness. Just a cold is enough.

LUCA CHIANCA

If someone goes into the fields they don't take all these measures?

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

Of course.

LUCA CHIANCA

I mean, here the problem is intensive farming?

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

Yes.

LUCA CHIANCA VOICE-OVER

It was only the start of February and coronavirus seemed like a purely Chinese problem. Visiting this intensive pig farm in the province of Reggio Emilia, with the highest standards, shows us that the human-animal relationship is one to be handled with care.

LUCA CHIANCA

It's not that we can get ill, it's that we can bring disease to them.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

Yes.

LUCA CHIANCA

But it's striking, this sort of quarantine; we're entering an area that's off limits.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

It's called biosafety.

LUCA CHIANCA VOICE-OVER

Intensive farming is now the norm in our country. Barns like this with thousands of animals being fattened up inside. The pastoral image of animals grazing is only the exception, a costly one. Wild animals transmitted today's coronavirus to humans, but if we look at the history of epidemics over the last 20 years, we know for sure that the same happened with SARS, MERS, Zika and Ebola. And who knows what kind of biosafety can be found in this other farm in the province of Brescia that we visited a few days ago with the Essere Animali association.

LUCA CHIANCA

But why isn't it possible?

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

It can't be managed. Not at an organisational level, because of the workload, to achieve numbers at least in line with the market.

LUCA CHIANCA

You need more workers, you need more, also... because I can't see anyone here. What amazes me is that here I can't see anyone..

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

You only need one person for a thousand pigs.

LUCA CHIANCA

Only one person, with a thousand pigs! And if they were grazing, one wouldn't be enough.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

One would be enough for grazing too, but the problem with grazing is the organisation.

LUCA CHIANCA

It only exists in adverts, basically.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

Yes.

LUCA CHIANCA

So they sell milk and tell us that it comes from mountain pastures, and the same for beef and pork ... but everything is inside.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

Yes. You'll start to smell it.

LUCA CHIANCA

Now, yes.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

Ah, they're eating.

LUCA CHIANCA

Wow... They go there to eat, then come here. See how calm they are here? Food's coming. Now they smell it and come through the gates...

LUCA CHIANCA

It's disturbing.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

But it's always like this. When food comes it's like this. For them it's normal.

LUCA CHIANCA

It smells. What is it, ammonia?

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

It's the ammonia that builds up. But we're talking about pigs that are soon going to be slaughtered, so it's the stage when they weigh and defecate more.

LUCA CHIANCA VOICE-OVER

The company applied for an expansion of up to 6,000 animals and the Emilia-Romagna Region insisted on a series of limitations to curb the impact on the environment.

LUCA CHIANCA

Here you haven't installed systems to filter this strong smell. It's the only thing you haven't done.

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

No, because you personally don't have to come inside here to work. You can't smell it outside.

LUCA CHIANCA

But the animals won't feel well either here if it's all shut up...

DARIO GUALINI – MANAGER OF TENUTA SAN VINCENZO FARMING COMPANY (PROV. REGGIO EMILIA)

No, these animals don't feel bad. They're absolutely fine.

LUCA CHIANCA VOICE-OVER

With a 320% increase in the number of pigs, the company estimates a 200% increase in ammonia emissions. Low, in their view, in proportion to the increase in animals. But it's the sum that makes up the total. You need only cross the road to find another company. In the middle is Claudio Giacca.

CLAUDIO GIACCA

This is the problem of problems. Because there's never been such a big intensive farm in Reggio Emilia.

LUCA CHIANCA

How many of them were there?

CLAUDIO GIACCA

12,000 animals, like a town without an adequate sewer system.

LUCA CHIANCA

All the spreading happened in front here.

CLAUDIO GIACCA

It happened in this area.

LUCA CHIANCA

So it reached you here.

CLAUDIO GIACCA

It overflowed with waste. Here, it was: we were floating in waste.

LUCA CHIANCA VOICE-OVER

Waste from the animals is stored next to every intensive pig farm in these enormous tanks, to be disposed of in the fields at precise times of the year.

CLAUDIO GIACCA

Here are the lakes. 17 lakes holding 77,000 cubic metres of waste. This is how they were spreading the waste until a few years ago. Instead of spreading it at ground level to avoid an aerosol effect and air pollution, they spread it at high pressure like this, so I'll let you imagine; when there was a bit of wind it went everywhere.

LUCA CHIANCA

It was right under here, right?

CLAUDIO GIACCA

Yes. Not only did they spread it like this, but they emptied their lakes directly into the channels, which arrived at the Po. People had to shut themselves in their homes because of the smell, but it got you in the throat; my wife ended up in hospital.

LUCA CHIANCA VOICE-OVER

Farming has really changed in these areas of Emilia. Once there were many little farms spread out over the land. Now they've moved towards Lombardy and Veneto and are all concentrated in barns. You don't see an animal grazing anywhere in the Po Valley. An American colleague of Professor Viaroli noticed it on a visit to Parma as well.

PIERLUIGI VIAROLI - LIFE SCIENCES DEPARTMENT- PARMA UNIVERSITY

He said, "But how do you make all that Grana and Parmesan cheese when there isn't a single cow around?" And I replied, "You can't see them, but they're in the sheds." But

the interesting thing is that the agricultural and livestock system of the past was almost self-contained. It was a product that came out of the sheds, not waste. Manure was a prized commodity.

LUCA CHIANCA

What was once invaluable has become a huge problem to be solved...

PIERLUIGI VIAROLI - LIFE SCIENCES DEPARTMENT- PARMA UNIVERSITY

There's a stage at which this probably took place, when pigs began to appear en masse.

LUCA CHIANCA VOICE-OVER

There was an increase in pigs from 1 million to no fewer than 7 million, as early as the beginning of the 1980s, with a decrease in cows, now around 4 million in number.

PIERLUIGI VIAROLI - LIFE SCIENCES DEPARTMENT- PARMA UNIVERSITY

Manure isn't produced any more, now it's waste with a high water content, and I'm afraid we've passed the threshold of sustainability.

LUCA CHIANCA VOICE-OVER

We're in the province of Brescia. These are all tanks containing waste from livestock. It stays in the open for the whole winter before being spread on the land. But as it evaporates it produces great quantities of ammonia, which end up in the air and form PM₁₀, which the Po Valley seems unable to do without, even in this period when nearly all cars are staying put. In this area there are no fewer than 2 million pigs and nearly 1 million cows per million residents. There are two pigs and cow for every Brescian.

FARMER

You just need to look around here; there's a farm at every corner.

LUCA CHIANCA

What will these be?

FARMER

Chickens or pigs. This is another one. These are new installations.

LUCA CHIANCA VOICE-OVER

Antonio is one of the many farmers who stick to the rules and everything revolves around the waste produced by the intensive system.

FARMER

When the concentrations of animals are so high, the problem isn't using dung or liquid waste to fertilise the fields instead of chemicals so much as disposing of it.

LUCA CHIANCA

There are limits. They're not observed?

FARMER

No. Some chuck it on maize stubble from the previous year, for example; I pass by today and no one objects; I pass by again tomorrow and chuck it on three times and no one notices.

LUCA CHIANCA

Right. Are there checks in this area or not?

FARMER

Yeah, they exist, but the chance of getting caught in the act is pretty low.

LUCA CHIANCA VOICE-OVER

Passing through the province of Brescia, we come to Montichiari, at a point where three farms are packed into an area of just a few kilometres. This pipe emerges in the middle of this enormous stretch of land and seems to be connected to one of the farms.

LUCA CHIANCA

This tube here, that one down there: it's connected to the sheds?

GIANNI SLANZI – FARMER

Instead of going back and forth with the tractors we use this, which pollutes less...

LUCA CHIANCA

It's less work; I don't know about the pollution...

GIANNI SLANZI – FARMER

Tractors pollute a lot more...

LUCA CHIANCA

What does this do? Spray it in a circle?

GIANNI SLANZI – FARMER

No no, it goes out and down, stays put, like this. Takes a leak.

LUCA CHIANCA

Takes a leak into the aquifer though.

GIANNI SLANZI – FARMER

Well, sure.

LUCA CHIANCA VOICE-OVER

Gianni works in the farm with 7,000 pigs and that's where the waste comes from. He maintains that it's all in order, but they were fined last year.

LUCA CHIANCA

But can you do this?

GIANNI SLANZI – FARMER

You should ask the guy who confiscated it.

LUCA CHIANCA

Because this field has already been confiscated?

GIANNI SLANZI – FARMER

Yes, because we were spreading the stuff while it was raining.

LUCA CHIANCA

And you can't do that.

GIANNI SLANZI – FARMER

You can't do that.

LUCA CHIANCA

When it rains?

GIANNI SLANZI – FARMER

When it rains.

LUCA CHIANCA VOICE-OVER

According to the regulations, after each spreading you need to go over it with a disc harrow to mix up the soil to avoid atmospheric ammonia emissions.

GIANNI SLANZI – FARMER

We need to go and get the disc harrow in 10 days.

LUCA CHIANCA

It's too late...

GIANNI SLANZI – FARMER

It's too late. You're right.

LUCA CHIANCA VOICE-OVER

The president of the Coldiretti agricultural association, Ettore Prandini, is also from the Brescia area, a dairy farmer with no fewer than 800 animals.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

Today we're obliged to work that land within 24 hours, which we do as instructed, because at this point we're being persecuted. If we wanted to bring out much more material than the law allows, a second later we'd be stopped immediately, reported...

LUCA CHIANCA

And fined...

ETTORE PRANDINI – COLDIRETTI PRESIDENT

And fined.

LUCA CHIANCA

You've been fined yourself.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

I've been fined myself?

LUCA CHIANCA

By the environmental guards.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

No, the environmental guards came to my farm once...

LUCA CHIANCA

...and fined you for a case of irregular spreading.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

Absolutely not.

LUCA CHIANCA VOICE-OVER

We found this report, where the environmental guards found spreading on the land of

the president of Coldiretti at a time when there was a ban. These photos were enclosed with the report.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

The fact is that no one has managed to demonstrate to me that one of my employees, from a business belonging to me, took out the waste at a time when there was a ban or restriction.

LUCA CHIANCA

So you never paid that fine?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

No, I never paid it and I don't believe I was notified about it afterwards either.

LUCA CHIANCA

But did you make it disappear?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

No, absolutely not.

LUCA CHIANCA VOICE-OVER

Even if we don't know who did the spreading, the fact is that there was waste on land owned by the president of Coldiretti at a time when it shouldn't have been there. And finally, from the road, we see some cows.

LUCA CHIANCA

This is all urine, excrement?

FARMER

Yes.

LUCA CHIANCA

But, is it normal, all this muck and urine?

FARMER

Yeah. Afterwards we move it with the tractor.

LUCA CHIANCA VOICE-OVER

Given the state of the farm, we convince him to clean up.

LUCA CHIANCA

All right! A good clean, right? So when did you do it last?

FARMER

We do it every day.

LUCA CHIANCA

Bloody hell: how much do they produce? So much?

FARMER

Oh yes. It may not seem like it, but there's the problem of the nitrates directive – as you'll well know if you look into it – that when it comes to waste spreading... well they're a pain in the neck.

LUCA CHIANCA

You don't know what to do with all this stuff?

FARMER

We've got tanks and storage.

LUCA CHIANCA

And where's that?

FARMER

Out back.

LUCA CHIANCA

Can you show me?

FARMER

Look, if you want to shoot the outside, fine. Otherwise, afterwards it's really... I mean...

LUCA CHIANCA

I'm putting you on the spot?

FARMER

They might kick up a fuss. Afterwards these images go on...

LUCA CHIANCA

On TV?

LUCA CHIANCA

Yeah.

LUCA CHIANCA VOICE-OVER

It's mid February, and while here coronavirus was starting to spread rapidly, a few days ago the farmers had started the first spreading of the season after the stop imposed by the Region to prevent the waste entering the water channels because of the rain.

LUCA CHIANCA

Is this from cows or pigs?

PIERCARLO NICOLA – FARMER

Cows, cows.

LUCA CHIANCA

It's so liquid from cows?

PIERCARLO NICOLA – FARMER

Yes, it seems like a lot to you, but to make it spreadable, so the spreader can draw it, you need to make it liquid, so you add 50% water.

LUCA CHIANCA

Listen though, loads of people drain into the waste, into the channels...

PIERCARLO NICOLA – FARMER

Look. I'm a farmer, I'm a conscientious person: here there's an irrigation ditch; I've got my farm; I take a pipe, chuck it in and stand here watching the sh*t from my farm plop

into the ditch. Could you do that?

LUCA CHIANCA

I couldn't do that.

PIERCARLO NICOLA – FARMER

I couldn't do it, I couldn't.

LUCA CHIANCA

And I believe you. But lots of people do.

PIERCARLO NICOLA – FARMER

And I can't understand it.

LUCA CHIANCA

Because this is an area with really high nitrogen levels.

PIERCARLO NICOLA – FARMER

Really high, that's right.

LUCA CHIANCA VOICE-OVER

To avoid nitrogen being dumped into the aquifers, the Lombardy Region has divided the areas of its provinces by soil permeability. This, for example, in the province of Brescia, a matter of kilometres from the river Oglio, is considered vulnerable. Marco Bartoli, at the University of Parma, monitors the quality of the aquifers and of the waters of the Oglio.

MARCO BARTOLI - LIFE SCIENCES DEPARTMENT- PARMA UNIVERSITY

If I spread more than 500 kg of nitrogen in a town, I go more than three times over the permitted levels, 170 kg.

LUCA CHIANCA

Too many cows, too many pigs, all there.

MARCO BARTOLI - LIFE SCIENCES DEPARTMENT- PARMA UNIVERSITY

Concentrated. But it's also an area defined as very permeable here; so if there's an excess of waste or fertiliser, when it rains, when the field is irrigated, it percolates and pollutes the aquifers.

LUCA CHIANCA VOICE-OVER

The Po Valley is at the centre of a water network, which in the case of tributaries like the Oglio flows into the Po and then out to sea. Lombardy's Councillor for Agriculture, from Brescia, maintains that nitrogen is still needed throughout the region to fertilise the soil.

FABIO ROLFI – LOMBARDY REGION AGRICULTURE COUNCILLOR

It's not at all true that we put more in the ground than the crop cycles in Lombardy can deal with. Lombard agriculture as a whole requires an average of 175,000 tonnes of nitrogen per year; we provide around 125,000.

LUCA CHIANCA

But the problem I was talking about is that 170 kg are allowed per hectare, and in the Brescia area you find 500 kg per hectare; that's the issue, and what isn't absorbed goes into the aquifer...

FABIO ROLFI – LOMBARDY REGION AGRICULTURE COUNCILLOR

Look, we came out from the EU infringement in part because the sample data on the polluted points in the deep aquifer, the surface aquifer, highlight a situation which is broadly static and improving at certain points. The most telling information is that the most polluted points are where there is less intensive farming.

LUCA CHIANCA VOICE-OVER

According to Professor Bartoli's analysis in the Oglio area in the province of Brescia, the opposite is true.

MARCO BARTOLI - LIFE SCIENCES DEPARTMENT- PARMA UNIVERSITY

We were surprised to see that, on a certain stretch about 20 km downstream of Lake Iseo, the concentrations of nitrates are increasing exponentially. There are no purifiers, no particular industrial centres in that area that would justify this increase.

LUCA CHIANCA

Is it not true that too much attention is paid to defending farmers rather than to defending the land in this case?

FABIO ROLFI – LOMBARDY REGION AGRICULTURE COUNCILLOR

Well, 42,000 farms, 60,000 employees, more than 70,000 families revolve around this world. We're dealing with one of the major economic pillars of this region.

LUCA CHIANCA

But it depends whether it harms the environment in which all these people live; now I'm summarising.

FABIO ROLFI – LOMBARDY REGION AGRICULTURE COUNCILLOR

Small surveys from the ARPA (regional environmental protection agency) in the national nitrates plan do not demonstrate that the aquifer has worsened.

LUCA CHIANCA VOICE-OVER

We return to our farmer spreading the waste from his animals on the land, when Sabrina arrives on foot along the country road.

LUCA CHIANCA

Wherever were you? You popped up out of nowhere; there's nothing for miles around here.

SABRINA PIACENTINI – EX MUNICIPAL POLICE CHIEF, QUINZANO (PROV. BRESCIA)

I often come here in the middle of the fields...

LUCA CHIANCA VOICE-OVER

Sabrina is the former municipal police chief and now works as environmental consultant for the local council.

LUCA CHIANCA

It's not OK as it is?

SABRINA PIACENTINI – EX MUNICIPAL POLICE CHIEF, QUINZANO (PROV. BRESCIA)

Too high. Now if you lower it, you'll see the difference in the field.

LUCA CHIANCA

OK.

SABRINA PIACENTINI – EX MUNICIPAL POLICE CHIEF, QUINZANO (PROV. BRESCIA)

If he answers, because I'm not going under that.

LUCA CHIANCA

Doing it the way they are now, spraying, they're polluting something chronic.

SABRINA PIACENTINI – EX MUNICIPAL POLICE CHIEF, QUINZANO (PROV. BRESCIA)

Do you know how hard I'm working now? The atmospheric emissions here all head straight out, of course. Listen Nicola, could you do me a technical favour so we can understand? Can you lower the flow of what you've got in the spreader? Spread it at ground level.

LUCA CHIANCA

As it should be.

SABRINA PIACENTINI – EX MUNICIPAL POLICE CHIEF, QUINZANO D'OGGIO, BRESCIA

As it should be, yes. Spread it at ground level so we can see the difference on the field with the same amount.

LUCA CHIANCA

There, it's down. That way it'll take longer to do the whole field. That's his problem.

SABRINA PIACENTINI – EX MUNICIPAL POLICE CHIEF, QUINZANO (PROV. BRESCIA)

That's his problem.

LUCA CHIANCA VOICE-OVER

This is the map of ammonia emission density in the Po Valley. The red part, with the highest levels, corresponds to the triangle between Brescia, Mantua and Cremona, the one with the largest number of farms. We talked with the Lombardy ARPA official who studies the phenomenon of PM₁₀ pollution.

LUCA CHIANCA

How great an effect does the ammonia that comes out of farms have on the formation of PM₁₀?

GUIDO GIUSEPPE LANZANI – LOMBARDY ARPA

It plays a role above all in the seasons when the most waste is spread.

LUCA CHIANCA

From cows and pigs on the land.

LUCA CHIANCA

What you were able to observe is a correlation between spreading periods and increased PM₁₀?

GUIDO GIUSEPPE LANZANI – LOMBARDY ARPA

Yes. It's clear that the inorganic component is definitely greater in periods when the ammonia is higher, corresponding to greater waste spreading in farming.

LUCA CHIANCA VOICE-OVER

According to ARPA figures, 85% of ammonia in Lombardy comes from waste produced by farms and, according to their analysis, ammonia is one of the main factors in the formation of PM₁₀.

LUCA CHIANCA

If we wanted to rank them, where would we put farms when it comes to pollution, their impact on the environment?

RICCARDO DE LAURETIS – ENVIRONMENTAL PROTECTION AND RESEARCH INSTITUTE

It's a tie. The Po basin, tied with road transport, wood burnt in fireplaces and industrial activity.

LUCA CHIANCA

So, bizarrely, we're in the position that we should ban cows on Sundays rather than cars?

RICCARDO DE LAURETIS – ENVIRONMENTAL PROTECTION AND RESEARCH INSTITUTE

Exactly.

LUCA CHIANCA

When you put your proposals to trade associations, how do they respond?

RICCARDO DE LAURETIS – ENVIRONMENTAL PROTECTION AND RESEARCH INSTITUTE

The first response is always 'No.'

LUCA CHIANCA VOICE-OVER

For the whole of February, the Lombardy Region actually authorised, no fewer than seven times, spreading in the Brescia area despite a ban being in force.

LUCA CHIANCA

During the ban, you authorised additional spreading, right?

FABIO ROLFI – LOMBARDY REGION AGRICULTURE COUNCILLOR

Right. The constraint of sixty days with a ban on spreading as standard during the winter is archaic. Our proposal is that we spread according to the agro-meteorological forecast, to the weather.

LUCA CHIANCA

Do it when it isn't raining.

FABIO ROLFI – LOMBARDY REGION AGRICULTURE COUNCILLOR

Exactly.

LUCA CHIANCA VOICE-OVER

In February, the days when spreading waste on the land was authorised by the Region nearly always coincided with excessive PM₁₀ in the province of Brescia. A few days ago the Italian Society of Environmental Medicine published a position paper which posits

that PM₁₀ aided the spread of coronavirus in the Po Valley.

ALESSANDRO MIANI – PRESIDENT, ITALIAN SOCIETY OF ENVIRONMENTAL MEDICINE

For some viruses this is something that already exists, in the case of the avian flu virus, the measles virus, so the metre recommended today as a safety distance may not be enough in certain conditions.

LUCA CHIANCA VOICE-OVER

According to the paper currently being studied, particulate matter has carried virus particles tens of metres like a plane, increasing infections.

LEONARDO SETTI – DEPARTMENT OF INDUSTRIAL CHEMISTRY, BOLOGNA UNIVERSITY

Of the cells that we find on particulate matter, 4% on PM₁₀ are actually viruses, and this figure comes from Beijing, between 2012 and 2013, on Chinese particulate specifically.

LUCA CHIANCA

And what came out from your studies?

LEONARDO SETTI – DEPARTMENT OF INDUSTRIAL CHEMISTRY, BOLOGNA UNIVERSITY

That where we had the most excess PM₁₀ in February, the month where the virulence expanded here, there was a statistical increase in the number of people infected, precisely because we don't only infect people two metres away from us but also risk infecting people 10 metres away.

LUCA CHIANCA VOICE-OVER

The study mentions the case of Brescia specifically, the area we travelled throughout February, when they were at work spreading waste. It correlates the number of cases of excess PM₁₀ levels with the increased spread of COVID-19 in the population.

LEONARDO SETTI – DEPARTMENT OF INDUSTRIAL CHEMISTRY, BOLOGNA UNIVERSITY

Yes, that's exactly it. And we've seen that there are growth curves based on the data we have from the Civil Protection Department, and what we can see is that the province of Brescia is second only to Bergamo in terms of infections.

LUCA CHIANCA VOICE-OVER

The Italian Aerosol Society instead maintains that 'this area of knowledge is still very limited, obliging us to adopt the utmost caution'.

SIGFRIDO RANUCCI IN THE STUDIO

Definitely, we need to investigate, because the cow and pig excrement released into the environment causes an increase in the evaporation of ammonia, which in turn promotes an increase in particulate matter, in PM₁₀, in the atmosphere. This information is also supported by the research of our Luca Chianca, who took the data from the Lombardy ARPA and checked its relationship with the authorisations to spread excrement on the land between 7 and 25 February, finding that it did correspond to an increase in PM₁₀ in the atmosphere. And this would have gone some way to help spread the virus. This is the conclusion of a position paper promoted by the association of doctors for the environment, SIMA, written by the Universities of Bari and Bologna, who aggregated and correlated the data collected by the regional environmental protection agencies, who compared this data with the areas where the virus spread. But it should

be noted that the researchers based their work on a study carried out by researchers at the Peking and Shanghai University with collaboration from the University of California, San Diego, which analysed Beijing's polluted air between 2012 and 2013. They isolated 106 samples of PM_{2.5} and PM₁₀. And what did they find? They discovered that 4% of the material on this PM₁₀ was made up of viruses. They didn't identify, didn't search for the coronavirus of course, because we didn't know about it at the time. All the same, it's a study to be much appreciated and worthy of attention because in these days, at the Harvard T.H. Chan School of Public Health, researchers led, needless to say, by an Italian – another resource to have left us –, Francesca Dominici, an authority in this area, have analysed 3,080 counties in the United States and discovered that, where pollution is more widespread, mortality linked to COVID-19 increases by as much as 15%. Our Giulia Presutti asked the view of the National Institute of Health on this matter.

GIULIA PRESUTTI

A Harvard study has linked an increased presence of airborne ultra-fine particles to greater deadliness of the virus. As an Institute, do you consider this connection well-founded, and above all do you intend to do something for the future, that is, in the pandemic prevention plan – which we hope will be implemented next time – do you intend to include greater restrictions on harmful conduct that raises the level of airborne PM₁₀?

SILVIO BRUSAFERRO - PRESIDENT, NATIONAL INSTITUTE OF HEALTH

This is a perfectly robust study that correlates, as we said, exposure to PM_{2.5} in the years between 2000 and 2016 and looks at the areas of spread, where there have been deaths, but also the spread of COVID. The Institute's researchers will of course work on this kind of scenario.

GIULIA PRESUTTI

If this consideration proves to be founded, will you include this aspect, pollution, in prevention?

SILVIO BRUSAFERRO - PRESIDENT, NATIONAL INSTITUTE OF HEALTH

Well, actually there was a programme and there still is, the well-known Sustainable Development Goals, which considers pollution, and countries set targets to cut it. It wasn't connected with COVID, but the subject of particulate matter was present and it was known to cause or promote the onset of symptoms, also in children in this case. So in my opinion, what I can tell you is that we will have to conceive of creating mechanisms that allow us to reduce contributing factors as much as possible.

SIGFRIDO RANUCCI IN THE STUDIO

Well, in that case, with a ban on cars and boilers, we might have to add a ban on cows. According to the data from the United Nations Framework Convention on Climate Change, if we considered all the cows on the planet as a country, it would come third after China and the United States in terms of greenhouse gas emissions. The FAO too agrees with this, considering livestock one of the main causes of climate change. And the researchers of the Worldwatch Institute consider livestock responsible for 51% of atmospheric CO₂ emissions. More than cars, planes, buildings and industry. And then, there's the absurdity of a situation in which, according to a Greenpeace investigation, no fewer than 25 million euros of European funding are pocketed by the 495 farmers in Italy who pollute the most. And another question would be, how much bresaola do they make in Valtellina exactly? It's a valid question, because the problem gets even bigger here. And is a zebu equine, zebrine or bovine? It's an open question.

PATRIZIO DASSOGNO – FARMER

These are dairy cattle, then we have beef cattle on our farm as well.

LUCA CHIANCA OFF SCREEN

Down there, for example?

PATRIZIO DASSOGNO – FARMER

Down there, for example.

LUCA CHIANCA

They obviously have a whole different life compared to intensive farming, right?

PATRIZIO DASSOGNO – FARMER

Here they live differently also because they spend the winter in these fenced areas.

LUCA CHIANCA

In spring they leave.

PATRIZIO DASSOGNO – FARMER

In spring we begin, we put them to pasture in the fields around here in our area before heading up to the alpine pastures above, on both the Rhaetian Alps and the Bergamasque Alps.

LUCA CHIANCA

Up there.

PATRIZIO DASSOGNO – FARMER

Up there.

LUCA CHIANCA VOICE-OVER

The whole world knows Valtellina for its bresaola, even though only the final processing takes place in Italy, because most of the meat chosen for producing it comes from abroad.

LUCA CHIANCA

Meat arrives here from outside. Meat arrives from outside for processing here. The problem is that this meat isn't here. I look around – there isn't much meat.

PATRIZIO DASSOGNO – FARMER

With all the people who eat bresaola...

LUCA CHIANCA

Too many people want bresaola, but there isn't any here.

PATRIZIO DASSOGNO – FARMER

But there isn't bresaola here; there isn't the meat for making 'bresaola della Valtellina'. It's impossible.

LUCA CHIANCA VOICE-OVER

Among the biggest producers of bresaola is Rigamonti, recently acquired by the Brazilian JBS, the world's biggest meat processing company, with a turnover of nearly 50 billion dollars. Rigamonti's headquarters are in the province of Sondrio, in Valtellina.

LUCA CHIANCA

Rigamonti stated that it uses 3% Italian meat two years ago.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

That's right.

LUCA CHIANCA

The latest figure.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

That's right.

LUCA CHIANCA

No one's talking to us; the Bresaola Consortium doesn't give interviews; Rigamonti doesn't give interviews.

ETTORE PRANDINI – COLDIRETTI PRESIDENT

Coldiretti accommodated you, so we on the other hand are completely open to dialogue.

LUCA CHIANCA

How is it possible?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

Because evidently they know what the critical factors are.

LUCA CHIANCA VOICE-OVER

And who knows whether these critical factors are connected with using meat from the zebu, a bovine species farmed mainly in Brazil and used for industrial bresaola production.

LUCA CHIANCA

The Brazilian meat is zebu. What meat is that? What animal?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

It's an animal not found in Italy, fortunately, like a zebra, just for...

LUCA CHIANCA

Seriously?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

Oh yes. It isn't; it's similar...

LUCA CHIANCA

It's like a zebra?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

Yes, but it looks like a cross between a zebra and something bovine; it's not...

LUCA CHIANCA

Or even a camel, because I've seen it has a big...

ETTORE PRANDINI – COLDIRETTI PRESIDENT

OK, let's try again: let's say that it's more like a bovine, but it's not bovine, just to be...

LUCA CHIANCA

It's not bovine?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

It's not bovine.

LUCA CHIANCA

If it's not bovine, what is it?

ETTORE PRANDINI – COLDIRETTI PRESIDENT

It's a similar animal, not actually in the bovine family.

LUCA CHIANCA VOICE-OVER

Mato Grosso. We're in the heart of Brazil, where once there was only savannah. Today it's an immense space where thousands of zebu graze.

LUCA CHIANCA

These are zebu.

MARIO BURI – FAZENDA SÃO CARLOS

Zebu. There are various breeds: pied, shorthorn and horned...

LUCA CHIANCA

They have this typical hump on their backs.

MARIO BURI – FAZENDA SÃO CARLOS

The hump is a reservoir, like on camels. They come from India so they have a fat reserve...

LUCA CHIANCA

They're no zebras anyway.

MARIO BURI – FAZENDA SÃO CARLOS

No, zebras are something else.

LUCA CHIANCA VOICE-OVER

Mario Buri is an Italian fazendeiro who has lived for years in Mato Grosso, where no fewer than half of the population of 3 million have Italian origins. Mario has around 10,000 animals and has also brought the Piedmontese breed from Italy, which he often cross-breeds with zebu. His fazenda has no sheds. His whole farm is out to pasture in this vast expanse.

LUCA CHIANCA

We're talking...?

MARIO BURI – FAZENDA SÃO CARLOS

10,000 hectares.

LUCA CHIANCA

Where might I find your boundary?

MARIO BURI – FAZENDA SÃO CARLOS

Those trees are my boundary.

LUCA CHIANCA

Over there we have mountains instead.

MARIO BURI – FAZENDA SÃO CARLOS

Towards the inland.

LUCA CHIANCA

That's yours, again.

MARIO BURI – FAZENDA SÃO CARLOS

On the other side too.

LUCA CHIANCA

You own mountains, mountain ranges.

MARIO BURI – FAZENDA SÃO CARLOS

Yeah.

LUCA CHIANCA VOICE-OVER

Until 30 years ago, the Cerrado, a vast tropical savannah with unique biodiversity, was expanding in Mato Grosso. Humankind's progress towards the heart of the country to gain agricultural land changed it forever.

MARIO BURI – FAZENDA SÃO CARLOS

You can see the forest surrounding the pasture here.

LUCA CHIANCA

What we can see over there was once here as well.

MARIO BURI – FAZENDA SÃO CARLOS

Yes.

LUCA CHIANCA

So in what years was it deforested?

MARIO BURI – FAZENDA SÃO CARLOS

From 1990, 1995.

LUCA CHIANCA

I mean, how many hectares are we talking? Because it's hard to get your head round it.

MARIO BURI – FAZENDA SÃO CARLOS

This part here: 1,500 hectares.

LUCA CHIANCA VOICE-OVER

JBS, which owns Rigamonti in Valtellina, buys meat from farmers in Brazil, butchers it, packs it and distributes it round the world. According to Trase data, the bovine meat from JBS that arrives on Italian tables produces no fewer than 72,000 tonnes of CO₂ due to deforestation.

BRUNO BASSI - JOURNALIST, 'OLHO NON RURALISTAS'

In 2017, JBS received a fine of 5 million euros for buying livestock from deforested areas.

LUCA CHIANCA

JBS basically continued to use the same suppliers that earned it the fine even afterwards, right?

BRUNO BASSI - JOURNALIST, 'OLHO NON RURALISTAS'

Yes. One example is the Agro Santa Barbara company, which one of our investigations found to have accumulated the biggest number of environmental fines in the last 25 years. We're talking around 64 million euros. The problem here in Brazil is that less than 1% of all these fines have been paid.

LUCA CHIANCA VOICE-OVER

JBS was also involved a few years ago in a big corruption scandal involving no fewer than 1,800 Brazilian politicians who received large bribes from the company. On the road to Amazonia, we asked if we could come in and visit a JBS factory.

LUCA CHIANCA

You've invested in Italy as well. You've bought Rigamonti, the bresaola producer.

JBS EMPLOYEE

Ah, Rigamonti.

LUCA CHIANCA

You know it?

JBS EMPLOYEE

Sure. I haven't got the clearance to let you in.

LUCA CHIANCA

How many animals are slaughtered here every day?

JBS EMPLOYEE

Here 700, but in other facilities 1,500-2,300 animals a day.

LUCA CHIANCA VOICE-OVER

But today, deforestation has shifted further north, to Amazonia. In the state of Pará, the rate of deforestation has increased by 30% over the last year. That means nearly 10,000 square kilometres destroyed to increase space for farming. This map shows us the rates at which forest has been lost in Brazil in the last 20 years.

MORENO DI MARCO - CHARLES DARWIN DEPARTMENT - SAPIENZA UNIVERSITY OF ROME

So basically, everything green is the original tree cover in the 2000s, and everything pink is the density of loss; as you can see, the frontier is moving towards the virgin area of the Amazon rainforest.

LUCA CHIANCA VOICE-OVER

Moreno Di Marco is a researcher at the Sapienza of Rome who studies the effects of climate change in relation to the spread of pandemics, and one of the key factors is deforestation in tropical areas.

MORENO DI MARCO - CHARLES DARWIN DEPARTMENT - SAPIENZA UNIVERSITY OF ROME

The probability that infectious diseases of animal origin arise is greater in tropical areas with a lot of forest and biodiversity - and so wild species -, and where there's

environmental deterioration, like deforestation, for example. The risk of transmission to humans, if relatively low only from wildlife to humans, becomes much higher if we add an amplification mechanism involving transmission via livestock.

SIGFRIDO RANUCCI IN THE STUDIO

Making space for more cattle farming. That's the problem that causes deforestation. In the last thirty years, Brazil has changed from importing Argentinian meat to a position as the world's leading exporter of bovine meat. The biggest buyers are China and Hong Kong, with 767,000 tonnes of bovine meat each year, while we Italians import around 45,000 tonnes. Not a low figure for a country as small as ours.

But according to the Trase project, which monitors the global supply and distribution of Brazilian meat, Italy is the world's ninth biggest contributor to deforestation, which can't be stopped even by fining the farmers who get ahead by burning trees, because then they don't pay the fines, and then some get ahead by dint of bribes or through front companies. Our Luca Chianca on the other hand pushed ever further to the border, towards those forests that the scientific community tells us conceal a good 600,000 viruses still unknown to humankind. And if they get out, we might have a spot of bother...

LUCA CHIANCA VOICE-OVER

Father Danilo is a Xaverian who transferred to São Félix do Xingu 30 years ago, today the municipality with the highest number of animals in the whole of Brazil, with nearly 2.5 million cows at the edge of the Amazon rainforest.

FATHER DANILO - PASTORAL LAND COMMISSION, SÃO FÉLIX DO XINGU

At that time, São Felix was the frontier. Here around São Félix there was forest and a ton of mahogany. The woodcutters cut down the trees; the fazendeiros came and brought total destruction. They burnt everything. There were weeks, even a whole month, when you couldn't see the sun really clearly – you could only see smoke, just smoke.

LUCA CHIANCA

It's dangerous to be in this area and fight battles.

FATHER DANILO - PASTORAL LAND COMMISSION, SÃO FÉLIX DO XINGU

Well, I lost a friend three years ago overland, but he was the last person killed. They killed six there, because you're always facing people who want to defend land, land which often isn't legal. It's land that the fazendeiros have taken by force, and now the government is trying to legalise the land.

LUCA CHIANCA

A kind of amnesty, what might be an amnesty in Italy.

FATHER DANILO - PASTORAL LAND COMMISSION, SÃO FÉLIX DO XINGU

Yes, but it's an amnesty for someone who stole land though.

LUCA CHIANCA VOICE-OVER

The fazendeiros have occupied all the public areas around São Félix. The parliament is now debating a law to grant private ownership, legalising the position of those who occupied the land before 2018. Representing the interests of the fazendeiros of São Felix are two brothers, one the town's former mayor, the other the new head of the farmers' union.

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

I came here in 1980 as a woodcutter and I now own four properties in the municipality.

LUCA CHIANCA

Everything around us was once forest, a forest that's no longer here.

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

Yes, it was forest, but it was already this way when I bought it.

LUCA CHIANCA VOICE-OVER

João owns 15,000 hectares, with no fewer than 18,000 cattle. The former mayor, standing again in the coming elections, assures us that he bought the land.

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

The idea of occupied public land in Amazonia is a myth. It doesn't exist, but the government has to step in because 80% of companies here need to be legalised.

LUCA CHIANCA

But the Cerrado has basically been destroyed and legalised over the years. Won't legalisation encourage further deforestation to produce meat and build farms?

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

No, I think it's the other way round. In the Cerrado you could deforest 75% of your land in order to work it. Here in Amazonia, the limit is just 50%.

LUCA CHIANCA

Have you ever received a fine?

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

Yes.

LUCA CHIANCA

Even the former mayor of São Félix was pinched cutting down trees.

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

Yes.

LUCA CHIANCA

Did you pay the fine or not?

JOÃO DE SOUZA TORRES - FAZENDEIRO - EX MAYOR OF SÃO FÉLIX DO XINGU

I didn't pay it because I managed to prove that I was in the right.

LUCA CHIANCA VOICE-OVER

The government attempted to curb it by banning abattoirs from buying cattle bred in deforested areas, and prosecutor Daniel Azeredo in Amazonia has investigated many farmers.

DANIEL AZEREDO - FEDERAL PUBLIC PROSECUTOR'S OFFICE, BRAZIL

Unfortunately, they found a way to get around the agreements. We call it 'cattle laundering', because a company with cows in a deforested area, ready to be slaughtered, and unable to sell them directly, sends them on to another clean company, which sells them in their place without leaving a trace.

LUCA CHIANCA

But you know about 'cattle laundering', passing animals from an illegal farm to a legal one to resolve the problem of product traceability, right?

FRANCISCO DE SOUZA TORRES - HEAD OF THE FARMERS' UNION, SÃO FÉLIX DO XINGU

As far as I know, it doesn't exist.

LUCA CHIANCA

If 80% have legal problems, haven't been legalised, how do they sell the meat?

FRANCISCO DE SOUZA TORRES - HEAD OF THE FARMERS' UNION, SÃO FÉLIX DO XINGU

That's exactly why abattoirs don't have animals to slaughter right now. If you have an environmental issue, no one can buy from you. Farmers are selling more livestock for breeding than for slaughtering, and that can bankrupt them. That's why we need to legalise ownership.

LUCA CHIANCA VOICE-OVER

The big mistake is to think that this is a local matter. The biggest fazendas have capital that comes from the south of Brazil or from abroad. One of the most well-known fazendas is Agro Santa Barbara, the one that earned 64 million worth of fines over 25 years and sells meat to JBS, the world's biggest meat distributor.

MARIA LETTINI - DIRECTOR, FAIRR INITIATIVE

Farms make up a significant part of the global economy. We're talking 1.3 trillion dollars. Many big companies have risky portfolios because they hold many shares in companies in this sector. This business can't carry on like this. We've had the avian flu, the swine flu. There will probably be other pandemics in the future. Commitment from investors is absolutely essential for rapid change in this sector. And I believe that this time they won't get distracted from what's going on.

SIGFRIDO RANUCCI IN THE STUDIO

According to Trase, the bovine meat produced by the multinational JBS, the one which effectively imports 'bresaola della Valtellina', is responsible for producing 72,000 tonnes of CO₂ linked to deforestation. And in 2017 JBS also received a 5-million-dollar fine for it. JBS denies it and states that "99.9% of livestock purchases come from farms that meet the social and environmental requirements, i.e. the zero deforestation criterion." But this is the list of fines that *Report* has obtained. With respect to the accusations of corruption for paying 1,893 officials, JBS reminds us that it signed a leniency agreement - a kind of plea bargain - from which it emerged that 80% of the funding was official funding or unofficial funding resulting from extortion by public officials. But it follows that 20% is unjustified. Since the system of fines doesn't work, it might make sense to start looking at the planet in a different way. Maybe humankind should start thinking about abandoning the planet, because it's getting too small. If its 7.5 billion inhabitants went on with the lifestyle, the requirements, of an average Bengali, we'd probably only need an Earth as big as Asia to meet their needs. But if we adopt the lifestyle of an American, four Earths wouldn't be enough. Until the last stream has been polluted, the last tree has been cut down, the last bison has been killed and the last fish has been caught; until we realise we cannot eat the money in the banks. A true warrior is not someone who fights to kill another, because no one has the right to take another's life; a true warrior is one who sacrifices their life to take care of the defenceless, those who cannot provide for themselves, the elderly, and the children. True warriors sacrifice themselves for the future of humanity. Those aren't the words of a Legambiente or Greenpeace activist; it's the view of Sitting Bull, Sioux chief, 1890.