

Franco Borgogno

A Sea of Plastic

The overwhelming results of a scientific mission across the passage to the North West.

The Expedition

I've seen the wonders of nature; I have seen unimaginable colours and fascinating sights. I have seen polar bears and seals; I saw the power of the sea, the wind, the glaciers, the rock and the signs of millions of years of geological transformation. I have seen timid Inuit's smile, grateful for the sparkling summer light but also happy at our curiosity and proud of our interest in them, their environment and their culture.

I saw a grandmother, one hundred and four years old, greet all those who passed by her house enthusiastically, I saw little boys play basketball and baseball in the middle of nowhere and young babes carried in the hoods of their mother seal skin gowns, in equilibrium between the tradition of the costume and the magic of the future embodied by the smartphone already firmly in hand.

I have seen communities facing tough living conditions who are proudly able to retain their language and traditions. I have also seen what the rest of the world has given to this paradise: some level of progress that has made life more comfortable, but without any real interest or respect, there is pollution here and the place is affected by the waste coming from our cities. I saw sled dogs chewing on plastic cans and still more plastic waste being burned with other scraps by playing children.

That is not the most disturbing thing, however. Rather it was the lack of sea ice, which in mid-August should have already appeared. This is also a gift that the rest of the world has presented to the Arctic. Thanks to global warming, marine ice, which is the basis of the life cycle in this habitat, is appearing later each passing year and melting faster. According to scholars, polar bears have lost up to seven weeks of nutrition per year. Without ice, the Arctic risks losing its life. The world is at risk.

I did not see much plastic in the water, but there is a lot of it, as the drawings and the analysis carried out in the lab have shown us: Microfibers and micro plastics, too small for the human eye to see, are also present in large quantities here, in the masses of seaweed. They are invisible but there are as many particles as the stars in the sky, with their toxic substances dissolving in the water and becoming part of the food chain.

The analysis carried out in the months following the expedition indicates that there are between one hundred (at best) and six hundred and fifty fibres (in the worst case scenario) below 4.75 millimetres in length in each of the ten samples taken from Greenland to Cambridge Bay, the passage to the North West, in the deep Canadian Arctic.

The mix of emotions, images and information acquired between Greenland and Nunavut, the northernmost point of Canada, is a kaleidoscope in which the wonders of the Earth alternate with the problems of our time. If these areas were more densely inhabited, there would also be flows of travelling people, environmental migrants. There certainly could be within a few years. I have seen, in short, the beautiful and the ugly of this extraordinary planet. The beautiful is not always good in an ecological and ethical sense, but the bad is definitely always bad.

All this, however, can be avoided: it is a question of choice, it is down to us. Avoiding catastrophe is down to the consciousness of our role and the consequences of our behaviour. These are consequences that will affect all of mankind.

For the first time, in August 2016, a search dispatcher collected data on the presence of micro plastics and plastics in the North-West passage, Arctic Sea, I was there. I went to one of those mythical places - from the nineteenth century - for tourists and navigators, for nature enthusiasts and anthropologists, with researchers from the 5 Gyres Institute, along with other activists from various parts of the world.

I was fortunate enough to be among a group of what is now called citizen science - an activity now essential for scientific research in many fields, including the dissemination and preservation of our planet- and to be able to help document the situation with regard to the greatest pollution we are carrying out. I came there pursuing a dream: to travel, to observe nature, the environment, to see

human communities, and finally to spread the word and so provide my small contribution to the preservation of the Earth.

All of this is born from my peasant origins, I'm convinced. My desire to travel, the need to contribute to the preservation of the Earth and the inability to accept that something is thrown into the environment which, let alone being harmful - can be reused.

My first trips were those that took me from Turin, my city, to Roero, Langhe, Santa Vitória and La Morra, then to parts of Alba and Bra, in the province of Cuneo. With my family we went to my uncle's home, where we spent several weekends and summers. Traveling first in a FIAT 600, then in a FIAT 850. But those journeys, which appeared to be epic to me, became like hyperspace if they were on the train, on the 'Periwinkle'.

That feeling of wonder in observing the sights of others flowing in front of your window, objects, shapes, and daily actions stays with me even today. For me, the 'journey' does not define the experience that you experience once you reach your destination, as is often intended.

For me the time that many considered a bit tedious, the journey to finally get to the destination, the whole physical shift, is part of the magical experience.

Whether on the highway or the way home from the airport; stopping over in stations; the behaviour of people on the plane, on a bus, on a ship and on the train, waiting for luggage and looking at the "new world" when you come out of the place and looking at reality, when you have arrived at your destination.

Of course, the essential moment of a trip to the countryside was the walks in the woods behind my uncle's home: I try and recapture this sensation on every trip I go on. I delighted in the detail, the unexplored angles, life and nature in the most diverse manifestations. Finding new ravines, discovering small mysterious caves (I later realised that they were cellars or shelters for tools, but for me were the hideouts of pirates, the shelters of the partisans, Tom Thumb's hiding places...). Well at six years old I felt like a pioneer, without knowing who and what a pioneer was.

The decisive moment, the one in which I decided consciously that I would always travel, at any cost, came in my adolescence. My passion was strong but untamed. At the age of eleven or twelve I played basketball and left home two or three

hours in advance to explore Turin, my city. One day, in my random wandering taking trams and buses to find hidden treasures, I got on tram 16.

And at the beginning of Corso San Maurizio, near the Po and the city centre, I found the treasure named: 'Slice of polenta'. That is not a street of food, but a palace built by Antonelli: its official name would be Casa Scaccabarozzi, a stone's throw from one of his most famous masterpieces, which became the symbol of Turin: the Mole. It is an eccentric yellow house, thin - in fact - as a slice of polenta impaled in the ground: like a scalene trapezium plant, nine stories high (seven above ground, two underground). It is just 54 cm wide on the shorter side and no more than four and a half meters on its parallel overlooking the Corso San Maurizio.

Well, that discovery excited me so much to convince my mind that traveling – even just on a tram in Turin - is too beautiful, magical and liberating to give up. Everywhere, maybe a few miles away, even a few meters from your house, you can discover small and great treasures every day. Every corner of this Earth can reveal miraculous wonders, surprises and evoke the most sensational emotions.

Beauty can be found everywhere. Naturally this is more true of some places than others, but one only needs the curiosity that leads us to leave our minds free and open, so that our eyes take in the details, flavours, odours, shapes, colours and sounds – this is how joy is found in nature.

This passion hit me when I was just over five years old, with some high school companions, as a volunteer in Irpinia, after the earthquake that had devastated that part of Italy. For me it was a powerful experience, I knew that beauty is often found in tragedy, and that in every situation one can discover the people, their stories, their lives, their uses and their habits.

It is a powerful experience to find unity even in the midst of death; good people and bad people exist in every community. Differences and language are often transcended through the goodness of human nature.

My peasant upbringing is also crucial because I have been fortunate enough to appreciate nature in many ways: in the beauty of the forms, in the colours of the sea, in the endless variety of wildlife and in the hardness and strength of its laws. These are all things that trigger strong emotions.

When I was working with my uncles and cousins in the vineyards, not a day passed without a moment of unexpected natural beauty. The little shells that dotted the land on those hills, the legacy of the ancient seas, were my favourite surprise: they were there for millions of years before man on earth and I was the first to see them!

Maybe I was the last to see them, as fragile as I am. Since then, I've always wondered what would possess somebody to throw rubbish on the ground. It was the seventies and the concern for the impact of our actions and attention to the environment had just started to spread. Plastic, in particular, was the comfortable, lightweight, flexible and inexpensive response to many needs. Everyday use for a couple of decades had begun to expand.

It was used globally and plastic waste was treated like any other kind: thrown into the bin, burned, buried, and thrown into the canal, and so on.

No one litters in his own home, although it is often less beautiful to discover and preserve than woodland or a mountain trail. It's sad to think that one day kids might dig up plastic in a vineyard instead of shells. People explained that in a few million years paper and scrap would vanish. They did not convince me.

Finally, from the peasants I learned that if you have an object that can be reused, then why throw it away? That got me wondering: why do we throw away bottles, bags, or any plastic object? They are always reusable, in their original form or adapted. The answer I always came back to was: because it costs very little, so it's worth taking a new one. None of the reasons for not recycling ever really stood up to the test.

These were the musings of a child. As an adult, journalist and somebody who is passionate about nature, they led me to deepen my knowledge, to study, to ask, to document, and to try to understand. This is where we go back to the expedition.

The ocean is one, unique system. It occupies a large part of the earth's surface, about seventy percent, though we divide it into 'seas and oceans' and give different names to various parts of it. But it's one thing, just look at a globe. It is the 'most vital organ' of our planet, the one that creates and regulates life; it is like the heart for the human body. Fresh water courses are the arteries that carry blood to the heart (the ocean) after use; with evaporation and rainfall, the heart

pumps and redistributes blood (water) throughout the body (earth) to grant existence to different living beings.

The ocean regulates the Earth's temperature and, through doing so, the weather. It shapes the landscape, produces about half of the planet's oxygen, supplies food (and other nutrients) to billions of people, and is a way of communication and a platform for important economic activity. In short, it is a fundamental organ and it is essential that we deal with the oceans health as if it were our own. If we're not going to act charitably, then we should at least act selfishly.

I began to study in depth the problem of plastic waste. I started with the web, a great resource for those who want to find information dispersed in every corner of the world, reading the many articles and stories available. Then I contacted various associations, universities and institutions to gather more extensive research in various languages.

From Wood's Hole Oceanographic Institution, an authority on everything about the oceans, I read through various articles from our own Cnr-Ismar and other international institutions, arriving at the 5 Gyres Institute. Based in Santa Monica, Calif., 5 Gyres is a non-profit organization that for several years has been dealing solely with research and dissemination on this issue. Founded by Marcus Eriksen and Anna Cummins in 2009, both have worked closely with Charles J. Moore, oceanographer and captain, the founder of the Algalita Marine Research Foundation.

Research and warnings on the subject of 'plastic waste management and the dangers' dates back to the seventies. But, as is often the case, scientists' warnings are rarely heeded with much gravitas. Moore was among the first to become globally popular in dealing with widespread and systematic plastic wastage in the ocean.

Taking a boat from Hawaii to California, Moore passed through a seldom traversed area in the centre of the North Pacific. He noticed enormous amounts of plastic waste, which formed a kind of tundra with fragments of various sizes. He came back and relayed his story. That pool was called the 'Pacific Garbage Patch.'

A year before the foundation of the 5 Gyres Institute, Marcus and Anna, then associates of Charles J. Moore, had built a boat using fifteen thousand plastic

bottles and the engine of an abandoned Cessna plane. With that raft, Marcus navigated for two thousand miles from California to Hawaii with the goal of increasing his knowledge and collecting data on pollution from the Pacific Ocean. Since then, the 5 Gyres Institute has continued to work in a convincing and sustainable way: it is a point of reference in the United States and around the world for data collection, scientific research, and produced the first global model of diffusion of floating plastic waste. They are also critical for the awareness raising and dissemination activities among the public of all ages and political and for advising decision-makers and economic experts.

A growing number of initiatives, deliveries and important results have come through the work done with other academic and non-profit organizations. One great result is the law passed by former President Obama forbidding the use of microbeads, which are plastic microspheres contained in various products - especially cosmetics - and are one of the biggest culprits in terms of pollution of the Earth's waters.

In browsing the site of the 5 Gyres Institute in search of information and data, I came across an announcement of an expedition - the institute had already made sixteen in various seas around the world - for collecting data in the North West Passage in the Arctic Sea. It's fate, I thought.

I wrote to Marcus Eriksen and he told me about the project, and the people involved. Talking with him, I found out that it was the first time that data would be collected on the presence of micro plastics in that area, though the other oceanic basins have already been sampled for some time now. The story of my desire to see, to touch with my own hands and to testify, to tell of a possible natural disaster in course, was hidden. He was interested in my presence, but he was happy to be able to count on the work of researchers, to show how every citizen can contribute.

I fell in love with this idea. Dreams are the engine of my life: I was desperate to do it. They needed resources; they needed a structure that incorporates the many facets of an expedition: photos, videos, articles, public initiatives, sampling and further studies in our sea beds and our rivers.

A few days later, I told Silvia, friend and colleague, about this opportunity. "You have to go". Yeah sure, but how? I speak to Alexander, another colleague, and above all a friend. I have the eyes of an infatuated lover as I speak about the

endless possibilities. The story of the work I was preparing on plastic waste in the oceans, the magnitude of the problem, and how this extraordinary occasion came to light: an expedition in the Arctic Sea, in the North West Passage, a few miles from the North Pole.

The story of how good it all feels, if you seize the opportunity; but resources are needed and it is not easy to find them, because there are only a few weeks to say yes. He could have faked enthusiasm. Instead, he gets excited: "You cannot pass this up, Franco! You have to go." He proposes to talk to me about the European Research Institute, another non-profit organization, but focused on Turin, which deals with other research and environmental issues. No sooner said than done. I saw him the next day. There I find Frederick and Iskender, of Eri.

Now, my story starts in earnest: the problem of plastic waste, the opportunity of an expedition, an absolute first, and in addition, to an extraordinary place.. Voilà. They are also excited about these ideas. We started working: it's late, but the opportunity is unique, unmissable.

From that moment on, I get encouragement and enthusiasm whenever I talk about what is becoming a real project. I'm excited by all the people I try to probe on the issue. I want them just to mention some detail about the size of the plastic waste problem; the issue strikes and gives rise to great attention. What seemed a few weeks ago to me to be an electrifying idea has now taken on several whole new levels.

There are numbers that back up the problem of plastic waste in the oceans, and these are: more than 269,000 tons of plastic, 5250 billion pieces, floating -we only talk about the first thirty centimetres under the surface so far - scattered throughout the oceans and seas across the globe. Rough data emerging from the study led by Marcus Eriksen from 5 Gyres, published in 2014: Plastic Pollution in the World's Oceans: More than 5th Trillion Plastic Pieces, Weighing Over 250,000 Tons At Sea (Marcus Eriksen, Laurent CM Lebreton, Henry S. Carson, Martin Thiel, Charles J. Moore, Jose C. Borrero, François Galgani, Peter G. Ryan, Julia Reisser), we will discuss this later in slightly more detail.

The problem of this plastic infestation, as well as that of global warming, is the result of planetary dynamics, flows, and 'displacements'. Not the direct actions of humans, which seems to be most peoples' preoccupation. But the flows and displacements caused by humans: waste, gas and pollution are not confined to

the place where they are produced but move with the planetary dynamics (often and not accidentally with an inverse path to that of human beings). The consequential damages hit almost everywhere, and heavily, causing dangerous natural, human and economic disasters. Yet, curiously, if you talk about the risks caused by environmental damage (scientifically proven hazards) you are flagged as an alarmist. While on other fronts, the policy of fear is considered legitimate, sound and healthy.

Concerning oneself with environmental problems and possible consequences does not equate to being an alarmist or catastrophist. It's no different from a very ill person asking a doctor for the best solution. It's nothing odd, merely precaution.

Dealing with these dynamics is not (only) a question of ecology or ethics, but also an economic issue (costs are huge for both countries and individuals), security (broadly) and wisdom, attention to the future of the planet and of mankind.

The meeting point for all participants of our expedition will be Ottawa, Canada's capital. There, we will join other travellers, attending an extraordinary touristic-adventure voyage, promoted among others by the Vancouver Aquarium.

As a group we will go to Kangerlussuaq, Greenland, where we will embark on a Russian ship that is equipped for this type of journey and has a specialised crew of Arctic researchers. Then we'll go back to Greenland by drifting to Sisimiut, Ilulissat, and then cross Baffin Bay to enter Canada, from Pond Inlet, and enter the mythical passage to the North West in the Arctic Sea.

From that moment onwards, we will no longer find any country or community on our way to Cambridge Bay, which we will reach ten days after, the final port of call on our trip. Just reading the journey itinerary sets me shivering with emotion. For me this is the dream of a lifetime.

Over the course of the journey we will collect samples with two different sets of equipment, and we will make direct observations, from the ship to land, to document the presence of micro particles. Maybe even of plastics, if we find any there.

As a journalist, and a lover of nature, I simply couldn't pass this opportunity up. The European Research Institute is with me and supports me; Marcus Eriksen has welcomed me into the group of citizen researchers. We are ready to go.

Because we're dealing with an expedition to gather scientific data, with 5 Gyres team, Marcus Eriksen and the director of the Carolyn Box environmental program in particular, we also have to go through a preparatory phase.

In total, we are sent a long series of scientific documents, data, research, and explanations of the work protocol. There are five webinars - online video meetings - to better understand the theme, the research we will do, the environment we will be moving in, how we will work and if we have questions.

These online video meetings can also help you to get to know the team, meet them face to face: we will have to come together for a couple of weeks, in a short time we will have to gather a lot of information and, as I learned in my life as a player and coach of basketball, but also as a journalist, the team will be very important. At the beginning I wasn't aware of just how great the team would be.

What I will deal with will be a useful and interesting experience to experiment and comprehensively understand citizen science, which helps the simple activist or enthusiast to know not only the 'problem' at hand, but also how this can be documented and studied.

By early August, the webinars are done, the dossiers are read and all the equipment is ready. My heart is full of joy and enthusiasm. My mind is full of questions and hungry for surprises, images, and knowledge. The tickets are all booked

It's August 10th. Finally we leave.

Greenland

Greenland is one of those places that are somewhat mythical and hard to define. Everyone has heard the name Greenland though. We tend to associate it with Inuits, polar bears, ice and rock. It is an immense island, the largest on the planet. The surface is larger than that of Italy, France, Germany, Spain and Portugal, but the number of inhabitants is more or less the same as the historic centre of Venice: about 56,000.

Greenland is also, in our thinking and common perception, the image of what we define as the 'North pole'. It is one of the lands that, together with the Arctic Ocean, make up Arctic, which includes all that is above the line of the polar circle. Although the island's extreme sea point is below the circle. In practice, with its

towns, ports, airports, it is the place of contact and union between the infinite North and what we identify as 'civilization'.

In Greenland, a couple of hours after landing, we will embark on a ship taking us towards the North West over the next two weeks and will accompany us in our long search.

The meeting for expedition participants is in Ottawa, the capital of Canada, the country that - far more north - is completely open from the Atlantic coast to the Pacific, from the North West passage. From Ottawa we will fly to Kan-gerlussuaq, Greenland, and only there will we embark on the ship Akademik Sergey Vavilov, which is equipped for navigation and exploration in the polar seas. In short, from Greenland we will really start shipping and collecting data.

The trip to Ottawa is my time to get into the mind-set for this expedition. To reflect and read with clarity, carefully, what we are going to look for and how to document it. I observe the different people at the airport, whether they are gleeful holiday makers or sombre business people. I observe how all of them are so reliant on plastic, even here and now.

This is one of the key elements to consider in what will be our search: individual actions are a part of everything, the pieces of a much larger puzzle. For us, the subject matter is now so important, but to the girl that I watch cast aside her plastic cup in the non-recycling waste bin, it does not seem to matter whether that cup will eventually end up in an ocean on the other side of the world.

It might be eaten by a fish and be on the plate of the same girl in three years' time. As we learn every day, as the human connection between us grows, every element, like every word, can have enormous effects. That is why it is important not to trust only one's own perception of a problem, but it is good to consider the bigger picture, to be informed. We have already spoken of the 2014 estimate of the levels of plastic in our seas: 269,000 tons, 5250 billion pieces. How many of us consider the amount of plastic in the world that could potentially end up becoming waste?

Instead of thinking about what we're doing today, let's think about whether if Cristoforo Colombo had landed in America with a box of plastic bottles, or plastic bags, they would still be on Earth, at the bottom of the sea, they surely would be. And if the plastic had existed at that time, considering that in seventy years we

have produced so much that we are now near saturation, what would be the condition of the sea and the environment today? What would we fish for, plastic fish?

I think while I'm at the airport and I watch the flow of a normal day. I think about the plastic soles on my shoes. Synthetic fibres are present in our clothes, watches, eyeglasses, in our cars. And then the containers, the packaging... We use everything with extreme indifference, we do not care. Instead, we should have to think about it, we should act with conscience and avoid unnecessary consumption whenever possible.

I suddenly imagine a huge mountain of plastic, growing rapidly. I reflect as I search for the right music to score this experience with a 'soundtrack' before we arrive in Ottawa.

Now I'm in Canada, I'm going to the pole, but in the meantime I will have to deal with the stifling heat of the Canadian capital.

In the evening, we have our first meeting, where I meet all those who will take part in the voyage on the ship. We are given the various basic instructions on logistics and the rules to be observed, on the timelines of the transfer to Greenland. Then we met the 5 Gyres North West Passage Expedition 2016.

After meeting superficially online, during the webinar preparation for the expedition, it's time to meet in person. The faces seen on a screen, those voices heard by the PC, now become real people. And the expedition, through this physicality, becomes something real.

From this moment on, my senses are heightened; I have to assimilate every moment, every word, every image, every hue, and every noise of this experience.

I meet Kristy, Sherri t, Marcus, Carolynn, Madeleine, Janet, Kabir, Anne, Kyle, Paul, Mark, Liza, Jackie, Lan ... We are not all there yet, because some will reach us directly in Greenland and Rosemary is stuck in Boston. But in the morning at six o'clock we have the flight to Kan-gerlussuaq: will she make it? It would be a shame to lose a component of the expedition, the only fellow journalist present. I think about what she can do at this time and I'm glad I planned to arrive in Ottawa one day early in anticipation of the meeting.

The first part of the meeting is devoted mainly to the practical instructions for the journey to Greenland the next morning (the wakeup call is at 4.30!)

The second part, the one for the participants of the 5 Gyres Spectrum, is devoted more to our knowledge and to the first review of information on the operation of our own research: a first look at the tools we will use, the trajectory and the pump system. There will be a few words said about how we will move, and when we will stop. We talk about travel and what each of us expects from this experience.

A gorgeous, fresh and tasty craft beer works well with the launch of the expedition, and then we are off to bed: there is strong emotion, but no one wants to waste energy that will be very useful in the next few days. We have to rest.

I try, as far as possible with all the adrenaline coursing through my veins. Then 4.30 arrives in a hurry and head to the airport in the rain. We board a Canadian North charter flight. And Rosemary? She arrives aboard the plane at the last instant. She miraculously succeeded in getting to Ottawa from Boston, where she was stuck without her luggage, having come from Oregon. She travelled through the night via BlaBlaCar, ah the joys of modern travelling!

The flight from Canada to Greenland reveals some extraordinary landscapes. Flying in daylight, in the summer, allows us to admire a series of fascinating views, typical of the Great North. Immense and open spaces, thousands of lakes of all sizes. Then a rocky space appears that has been honed and shaped by ice and wind for millions of years, so we pass over the Labrador Sea that separates North America from Greenland, whose coastline is finally visible on the horizon.

The visual impact is extraordinary. The scenery provides us with a view of the sea: an intense, dark blue that creeps into the mountains, forming fjords in which the colour becomes blue and then turquoise, to the grey of the waters where the first glaciers appear to us coming from the west.

After a few minutes the ice covers everything and leaves only the peaks of the mountains free. So the horizon is occupied by a single large glacier that from this height appears flat, imposing, of a dazzling white soiled only by the chunks of land and gravel transported to the sea, this is how the Earth itself was modelled. The blue shades of the sea are myriad and indescribable as they flow underneath us,

alternating with the rock that takes on a rough pink hue, with rusty browns showing the earth that re-emerges here and there from the ice.