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FORUM

Behind the Scenes of *WE UP*
Climate Change and the Human Condition
“Home” as Memories
Two Decades of Sister School Exchange



GRANT REPORT

STATE OF CHANGE

Reflections on climate and the human condition in Alaska

Text and photos by Joe Yelverton

H

idden in the Romanzof Mountains of Alaska's Eastern Brooks Range are the chapters of an unfinished story.

North of the Arctic Circle, in an amphitheater surrounded by granite peaks, lies the McCall Glacier, anonymously recording our history, compiling the weather and seasons of snowfall like pages in a mystery novel. A story about the holocene, the ways of man, the way planet earth has changed.

In 1957 an esteemed scientist from Washington State decided the McCall glacier had a story to tell. Dr. Richard Hubley believed the McCall held important secrets, possibly even insight into our future. The young micro-meteorologist was the chief scientist of a four-man project intended to last sixteen months in the field, through the Arctic winter.

At the 8,200ft level of this remote glacier, Hubley's team set up camp in a modest research hut built on a layer of firm snow; beneath that, deep ice measuring hundreds of feet thick, thousands of years old. The temporary shelter held a wide range of equipment—radiometers, solarimeters, thermometers, fundamental weather instruments, apparatus for surveying ice, and shovels for digging snow pits. The team stocked enough provisions to last through the winter. On a small bookshelf inside the hut, works from various philosophers, and poetry by Robert Service.

Affixed to the top of the hut, sat a small anemometer, spinning in the wind. A simple device, a poetic metaphor—measuring something we can't see, attempting to understand a force of nature that's invisible, except for its effect. We can't see the wind but we can feel it, and we can see its manifestations. Like many quandaries of science, even complex human emotions—sometimes the result, the aftermath, is the only thing that gets our attention.

For a time the McCall scientists split into two teams, Hubley and his fellow scientist, Robert Mason stationed at the upper camp, while two other colleagues worked at a lower camp. The teams worked independently, but remained in constant contact via radio. Except for a lone VHF radio the remote location kept them virtually cut off from the outside world.

Late in the day on October 28 Hubley inexorably altered the course of his research.

He left the warmth and safety of his camp, leaving behind his unaware colleague, a man he'd been working closely with for the past five months, and he walked down the glacier about three hundred yards where he sat down in the snow. The same spot where his frozen body was found a few hours later.

This is where my fascination began—with the purpose of Hubley's work, and especially the mystery of his death—leading me to discoveries, as much about science as the human condition.

Long before the term "climate change" was coined, and before "global warming" was a part of everyday vernacular, Hubley believed there was a connection between glaciers and climate. His research came long before environmentalists began trying to "save the planet." And before many scientists were demonized, distrusted, and accused of having a biased agenda.

Hubley also died long before the Arctic National Wildlife Refuge was established, before Prudhoe Bay and the adjacent oil fields were developed, and long before Alaska became flush with cash from oil royalties.

BELONGING TO THE LAND

The Arctic Coastal Plain of Alaska is one of the largest intact and undisturbed ecosystems in the world. Nearly 25,000 square miles of undulating terrain, covered in treeless tundra, bordered to the north by the austere shores of the Arctic Ocean, and to the south by the foothills of the distant Brooks Range. Only one road crosses the entire "North Slope." The Dalton Highway, a lonely ribbon of gravel that provides vehicle access to oilfields at Prudhoe Bay.

Despite the footprint of the oil industry, the plains remain otherworldly.

The Alaskan Arctic is as undeniably complex as it is fascinating. Also a battleground. Some people devote their lives to protecting the pristine wilderness and everything inextricably connected to it. Others are focused on undoing these protections, and extracting its valuable resources.

Meanwhile the Arctic hangs in the balance, warming at a rate twice as fast as the Southern latitudes. The frontline of climate change.

**Sometimes the result,
the aftermath, is the
only thing that gets our
attention.**



Photo by Joe Yelverton

ABOVE: Qaiyaan Harcharek, an Iñupiaq whaler and resident of Utqiagvik, stands on the Arctic Coastal Plain, the frontline of climate change. **PRECEDING PAGES:** A boy pops a wheelie on the dirt roads of Utqiagvik.

We often think of land belonging to its inhabitants. In the Arctic they say the inhabitants belong to the land.

Qaiyaan Harcharek is a 35-year-old Native Alaskan Iñupiaq, born and raised in Utqiagvik, the northern most settlement in the United States, the place formerly known as Barrow.

Harcharek offered to drive me on a tour of the village and its surroundings. As a former city council member, he sponsored the ordinance to restore his town's original Iñupiaq name. What might seem like a simple thing was actually a powerful act: a step toward restoring one's heritage. When it came time to vote on the change the town was almost evenly split. In the end the anglicized name was traded for one with greater cultural importance. The vote reflected a deeper sentiment, and disparate ideologies.

It was summer in the land of the midnight sun. Also called a polar day—a single day that's actually 82 straight days long, when the sun circles the sky and never actually sets. This is a time of year when the Arctic is flooded with an ambient quality of light that seems to

energize every living thing. At midnight in Utqiagvik you'll see kids jumping on trampolines, riding their bikes, doing all the things kids do at midday in an ordinary rural town.

As we continued along on a road heading south outside of town, I was mesmerized by the passing view, an exposed landscape that evokes a sense of something sacred, but also a feeling of vulnerability.

I was hanging on Harcharek's words, his stories about life in a place with a relatively unknown and sometimes troubled history. We discussed first contact with Yankee whaling crews, the epidemics and disease they brought. The slow tide of cultural genocide brought by early colonialism, and boarding schools created by Christian missionaries that affected Natives all over Alaska.

There was a palpable sense of pride in Harcharek's connection to his heritage, also an understandable undercurrent of resentment in some of his stories. He attributes his own personal struggles with depression to historical trauma, unresolved grief passed on.

A manifestation of the wounds inflicted on past generations, when crimes committed against a society's culture shapes the identity of descendants.

As an English speaking white person I'm not sure I'll ever be able to appreciate what it's like to be forcibly relocated, to lose my home, or my language, or to be living under the threat of punishment if I follow my customs. Or to have any of that as part of my ancestry. I'm not sure my customs are even sophisticated enough to pass muster as cultural traditions, or for that matter if I even have a culture, so perhaps true empathy is impossible in my case.

Last summer I read an article in the *Anchorage Press*, "Of Shamans, My Ancestors, and Genocide" by Alaska Native Johnny Tetpon. He wrote, "Non-Native writers who reiterate the things I am talking about—sympathetic as they may be—do not know really know what they are talking about. Their take is third-hand; mine is first-hand because I am the one who experienced it."

I thought a lot about his words, especially these: "The search for truth for me, just for me, and not anyone else, took me back toward my ancestral beliefs."

I realized that's what I'm looking for—the truth, not to translate the experience of others, but to explore our beliefs as a society, and in a larger context—how our beliefs, and my own beliefs, relate to the current state of affairs, of our planet and humanity, and especially how people and societies treat each other.

This pursuit has continually brought me back to a haunting question:

Is the condition of our planet and the way we treat it merely a reflection of the way we treat one another? Especially how people in power treat more vulnerable populations?

For decades we told young Native kids that speaking their first language would send them to hell. If that wasn't bad enough physical punishment sometimes followed. That was often the message of Alaska based Christian missionaries. This, along with other initiatives aimed at "civilizing" Alaska Natives, was administered with the blessing of the U.S. government per the 1819 Civilization Fund Act.

Variations of this act persisted long through the 20th century. Not surprisingly, this madness and the result is largely unknown outside of the affected communities.

As we drove down the dusty roads of Utqiagvik I ruminated over social issues that I'd been sheltered from my entire life, wondering if being naive is a luxury or a curse.

Eventually our conversation hit the broader topic of oil, and since I was a former oil-industry employee, at least this was something I was fluent in. I asked if there was anything oil-related that concerned Harcharek.

"Encroaching industry," he answered, "They're moving east and west," referring to inevitable expansion of the National Petroleum Reserve.

"At the cost of what?" he added.

"Our people are so reliant on money. Fuel, good health care, beautiful schools. Without taxation from industry we wouldn't have that. But it's on our land. We understand where our money comes from and it's not that we aren't grateful."

He goes on to talk about the ways he believes his culture is facing a different kind of threat than in years past. Not just the threat related to climate change, which in many ways is more profound than anywhere else on the globe, but how the perceived benefits from industry are in some ways overwriting the Inupiaq culture.

Harcharek's sentiments reminded me of a passage in *The Way of the Human Being*, written by southwest Alaska Native Harold Napoleon.

The way many of us live now is abnormal, like caged animals. We are fed, housed, watered, cared for, but we are not free, and it is killing us. Since the early 1960's, Native people have seen their material lives improve. Yet, as their physical lives have improved, the quality of their lives has deteriorated.

COMMUNITY

When I arrived in Utqiagvik I was as curious about my own inherent judgments as I was with the nuances of this northern community.

I walked everywhere, stopping to have conversations with anyone willing to chat. Being a white guy with a big camera around my neck, occasionally I got sideways looks. A few people asked me, with some suspicion, "Are you a reporter?"

I came to learn about a perception, that nearly everyone visiting Utqiagvik is thought to be there for one reason: to take something. Whether it's stories, pictures, scientific data, or something related to oil.

As I walked along the shore of the Arctic Ocean one afternoon, I thought about the notion that most of us in modern society are "takers," to quote Daniel Quinn.

At the end of my walk I was greeted by a local man who appeared my same age. His tan face reflected a life spent out on the land

Is the condition of our planet and the way we treat it merely a reflection of the way we treat one another?



Photo by Joe Yelverton

USGS geophysicist Shad O'Neel explains the nuances of time-lapse photography at Wolverine Glacier on the Kenai Peninsula.

and sea. Gregarious and from the most famous lineage of whalers, his name was Lewis Brower.

After some small talk I asked about his whaling history. The conversation turned into a rich history lesson, fervently told, with a seemingly infinite backdrop often referred to as the Top of the World.

After an hour or so I asked Brower one final question. "What do you think I should take away from my visit?" He responded, "Well, what have you learned?"

I shared a few things, my observations.

Then he told me a story about a *New York Times* reporter who once asked him a similar question. So he asked the man, "Where do you live?"

"I live in New York City," the reporter answered.

So Lewis repeated himself, sensing the man didn't quite understand his question, "No, where do you live?"

"Well, I live in Manhattan," he answered.

"No, you don't understand, I want to know about your commu-

nity," Lewis clarified. "I live in an apartment building in Manhattan."

"Do you know any of your neighbors," Lewis asked.

"No, I've never met any of them except for bumping into them in the hallways and elevators."

So Lewis responded to the reporter, "When you go home I want you to introduce yourself to your neighbors. That's what we have that you don't have. We have community. We rely on one another."

TAKE A GOOD LOOK AROUND

Craig George is a long time resident of Utqiagvik and a marine biologist who studies bowhead whales, the world's oldest mammal, and an anomaly in a warming Arctic. "Unlike other less fortunate species, he says, "the bowhead appears to be thriving."

George was one of the early pioneers in bowhead research. "The bowhead whale fell off the moon in terms of science," said his former boss.

When George's career began he quickly realized that learning

about the environment was a prerequisite for learning about the mammals. It's easy to get killed in the Arctic without some understanding of safety on the sea and the ice. And then he realized that to learn about the environment he'd first need to learn about the people who knew it best, the Inupiat.

The irony is George was classically educated as a biologist, taught that researchers were the true experts, even taught to disregard traditional knowledge from the field. Living and working in a whaling community turned those notions upside down.

I was with the gray haired biologist in his old Subaru wagon, headed back to his house after a discussion on the beach. We went to look at some stranded icebergs, enormous "ice islands" that drifted south from the marine glaciers in the High Arctic.

As we were making our way through town, a crisscross of dirt roads, his neighbors waved as we drove by.

I ask George how long he's been in Utqiagvik. "Oh... a long time," he said. "I came here to work in the 70's and decided to stay."

The obvious question comes to mind, so I ask, "Why did you stay?"

"I can't really explain it," he said. "It's sort of like the song, 'My Hometown.'"

Thinking he might elaborate, instead the scientist (who is also an avid musician), begins to recite Springsteen's lyrics:

I was eight years old running with a dime in my hand. Into the bus stop to pick up a paper for my old man. I'd sit on his lap in the big old Buick.

And steer as we drove through town.

He'd tousle my hair and say "Son, take a good look around" This is your hometown...

And then he stopped, apparently content with his answer.

I learn that George is an enigmatic individual, a scientist-naturalist-historian, seemingly focused on the bigger picture, maybe even three steps ahead of you in the conversation, thinking about your question on a deeper level than you anticipated. But also possessing a rural sensibility, and a northern pragmatism.

NO REVERSE GEAR

Even if we possessed the most accurate scientific knowledge, we should not find it easy to persuade them by the employment of such knowledge. —Aristotle

Andy Mahoney's office looks like a gear room belonging to a typical adventurer, and if you met him on the streets of Fairbanks



Photo by Joe Yelverton

Wolverine Glacier in the Nellie Juan region of the eastern Kenai Peninsula. Continuously studied by USGS since 1966, Wolverine is known as a "benchmark glacier" because it is scientifically representative of other glaciers in the area.

“The science message is a difficult one to get through, and using a stick isn’t the way to do it.”

you might think he's a generic outdoorsman. Originally from the UK, he migrated to Alaska for the adventure and almost unwittingly ended up with a PhD. That sort of happenstance partly describes his current conundrum, doing work he loves, and doing it mostly behind the scenes, but having his research end up being part of the most contentious debate in America.

Mahoney is a reluctant harbinger of change.

"There's no reverse gear on this," he tells me, as if he'd just lifted his head from the microscope after observing the most basic of irreversible biological processes.

He's referring to the overwhelming loss of sea ice in the Arctic, particularly the thick and dense multi-year ice that's disappearing fast, leaving behind open water that remains for longer periods every year.

"We're not going to grow the ice back anytime soon," he says. "There's going to be wholesale changes."

In some Arctic communities, he adds, "It will be the equivalent of drought in Africa." Referring to diminished access to hunting and fishing grounds, which in many villages constitutes basic subsistence.

"Or villagers can completely give up and move to the city," he says. "And change everything that contributes to their identity."

Mahoney has a PhD in geophysics and is an assistant professor at the same department at the University of Alaska in Fairbanks. He studies climate change, coastal dynamics, ice-ocean interaction, and the relationship between Arctic inhabitants and sea ice.

"Oh, there's natural oscillation!" he says, jokingly, echoing the pseudoscience climate deniers. "There's always been cold years, warm years." But then in a more serious tone, he says, "But when you have forty-one years of warming in row, a cold year now, that was an average year many years ago."

It might surprise or even confuse climate change deniers, but Mahoney is not an "environmentalist," nor is he even remotely close to an "activist." He's really just a scientist trying to do good work.

"There's more lucrative ways to make a living," he said, referring to the popular theory among deniers and some politicians who accuse scientists of perpetuating theories about climate change for alleged financial gain.

"It's hard enough to get scientists to agree on anything, let alone the creation of a worldwide conspiracy," says Mahoney. "The fact that so many scientists agree on climate change and its causes, really says a lot."

But he admits, "The science message is a difficult one to get through, and using a stick isn't the way to do it." Mahoney suggests what's needed is an emotive persuasion. "As scientists, if we think our message is that important, we need to look at other ways of doing it. And sometimes that involves more of a personal investment."

At the same time, he offers, "As a scientist I'm very cautious about getting involved in advocacy. There is a line between the two."

Among his peers Mahoney is known for exploring the knowledge of coastal residents, especially those who know the ice because of subsistence activities. Then he leverages this in his research.

"The scientific method has rigors, and is great for making decisions," he said. "But it can't answer all of our questions."

He admits that it's taken him almost 20 years to begin to

translate indigenous knowledge. “That’s what I’m most excited about,” he said. “Relying on traditional knowledge for hypothesis creation. If we want to really understand what we should be asking, what we should be looking at.”

In contrast to the Arctic, Mahoney’s career began in Antarctica, an environment he refers to as “a bit sterile.”

Unlike the southernmost continent, he says, “It’s in your face in the Arctic, because people live there. And so there are stakeholders in your research.”

As part of a team of editors/scientists focused on the Arctic, Mahoney contributed to a book called *The Meaning of Ice*, an exhaustive compendium that explores the relationship Northern communities have with the frozen world around them.

Serving as a compelling reminder about our current public discourse, at the beginning of the book is an author’s note:

Translation from one language to another is an art. Even more so is the translation from one way of understanding the world to another.

CLIMATE CHANGE IS A DISTRACTION

Late in the winter Henry Huntington arrived in Tsiigehtchic, a small Gwich’in village on the banks of the frozen Mackenzie River. Starting in Fairbanks, Alaska, he was more than 700 miles into his 2,500 mile trip across the Canadian Arctic. Driving a snow-machine with a sled full of scientific expedition gear, he stopped in this Northwest Territory town and waited for his research colleagues to join him near the local school.

A young Athabaskan girl approached Huntington, no doubt realizing he was an outsider in a tight-knit community of 190 people.

The young Native girl asked, “Do you have kids?” “Oh yeah,” said Huntington.

Obviously curious, she presses him, “Where are they?” “Well, they’re at home,” he answers.

Even more perplexed, she asks, “Why didn’t you bring them with you?”

The exchange continued, the intersection of two different generations, and two different cultures.

Along with four other researchers, Huntington was a third of the way into a snowmachine supported expedition from Fairbanks to Hudson Bay. The team was enjoying some confidence, a sense of accomplishment in their adventure across barren and relatively unpopulated country.

And then he was confronted with a philo-

sophical question: *Why are you traveling across the rugged Canadian Arctic without your family?*

As Huntington recollects, “Because, to this young Native girl, the obvious thing would be to bring the kids along. Why would that pose any problem whatsoever? She wasn’t quite old enough to dismiss me as an amateur, but at the same time she was completely unimpressed.”

During his twenty plus years of doing Arctic research, Huntington has many times stood at the intersection of human experience, where different cultures and the common human condition meet.

He counts this particular interaction with an Athabaskan girl as being one of the most insightful, a contrast of cultures.

My path intersected with Huntington’s near his home in Eagle River, Alaska. With a backdrop of cars, and traffic, and busy lives, I learned about many of the unanticipated nuances of doing science in the Arctic, around indigenous people. Through Huntington’s stories, I gained insight into the culture of science in the Arctic, and how the trend is changing with regards to seeking out traditional knowledge and then integrating that into research.

As Huntington tells me, early Arctic exploration was undertaken by young, 19th century, European explorers chosen mainly for their physical attributes. A false sense of prowess was often traded for humility, when these explorers met well-suited Natives adapted to hard living. Entire families traveling cross country, including grandma and all of the kids. And yet despite the responsibility of keeping an entire family fed and safe, often in harsh conditions, early explorers described these encounters as puzzling. Two different groups traveling the same exact country, but the Natives were at home, and traveling in harsh conditions out of necessity, and never complaining.

In its purest sense the pursuit of science has led to amazing discoveries and, at the same time, the scientists, who often remain outsiders, have historically remained disconnected from the environment that’s part of their research, including any inhabitants who live there.

In that sense, Huntington is one of the emerging outliers.

His career as a polar scientist began with janitorial duties in Antarctica. Because he was primarily interested in earth sciences he thought the frozen continent would be a good place to start.

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Why are you traveling across the rugged Canadian Arctic without your family?

RIGHT: James Koonaloak (left) and Michael Thomas (right) outside the science division at Ukpeagvik Inupiat Corporation, an agency in Utqiagvik that provides logistics support to numerous science projects in the Alaskan Arctic

BELOW: Alaska author Don Rearden (left) interviews Utqiagvik resident Craig George (right) on the coast of Arctic Ocean. I traveled to Utqiagvik with Rearden as he was doing research for a new whaling novel. George is a well-known expert on bowhead whales and a senior wildlife biologist with the North Slope Borough.



Photos by Joe Yelverton

Early on in his career, he admitted to forming what he called, “The stunning conclusion that people are interesting,” which led to a completely different trajectory. He ended up taking a job doing a whale census in Utqiagvik. And when he arrived he realized he knew nothing about whales, or even much about the people, admitting that his basic sense of the place was derived from “reading a National Geographic.”

His life experience added up fast after that. He ended up moving to Utqiagvik, building a house, and eventually obtaining his Master’s degree in whaling culture. Later getting his PhD in Polar Studies, and now working as the Arctic Science Director at the Ocean Conservancy.

Huntington’s main research focus is documenting local knowledge, “trying to give credence to it,” whereas in the past scientists seemed to disregard anecdotal information “as if it was some kind of slur or something.” Huntington admits that while traditional knowledge may have none of the “hallmarks of science,” there’s no denying that “Natives stake their lives on their understanding of nature; they survive stern tests.”

“We talk about the tendency of scientists to be vested in their work, but not so vested in the place where their field work is done, especially if there’s a community there.”

I asked him what it was like living in a remote village.

“I lived there from 1988 to 1994, but still when I go back people say welcome home,” he told me. “It’s a sense of community. A remarkable feeling knowing I’m still somewhere in their embrace.”

I ask Huntington how often he gets that reception here, back in Eagle River or Anchorage and he laughs.

“If I left Eagle River and came back in twenty years I wouldn’t expect anyone to have the foggiest idea where I had been.”

Huntington goes on to talk about how that sense of community and culture is heightened when it’s under threat, as is the case with much of rural Alaska and the Arctic in general.

“Grandparents spoke the language, kids today don’t. If it’s not there today, what’s left? It’s on their minds a lot more.”

He admits that “seeing something different helps you see your own life differently.”

“What did I learn from my grandparents that I don’t want my kids to miss? I hope they have some connection with their heritage.”

At the same time, Huntington points out what he calls a “misguided romanticism” of the past when there was perhaps a more true

“sense of the land, but also when a trip to the store could take two months, and women giving birth in skin tents.”

He points out that in 1950 the life expectancy for Alaska Natives was 47 years old. In contrast, in the 90’s it was up to 67 years old.

“There may be other problems but let’s not over-romanticize the past,” said Huntington. “Natives who grew up poor understand this.”

Our conversation meanders toward climate change, a subject Huntington refers to as, “immensely fascinating and incredibly thorny.”

But he also takes a seemingly unconventional position, saying “climate change is a distraction.” Adding, “We’re not saying it doesn’t exist, we’re not saying it’s not a big problem. But climate change is the slow burn.” He cites other issues as having more immediate importance, saying “You have suicide, alcoholism, you have 101 other problems right here and now. And if all we do is focus on climate change we’re missing an awful lot of what’s affecting people’s daily lives right now.”

Alaska often ranks in the top three in the nation for the number of suicides per capita, and the statistics are worse when comparing urban areas to rural Alaska, which is often twice as high.

“It’s not that we should ignore climate change but we need to keep in mind where it fits into the much bigger picture,” says Huntington. “Science is as susceptible to trends and herd thinking as any other human endeavor.”

With an air of frustration, Huntington adds, “People start writing about climate change in villages because it’s convenient and the publishable Topic-de-Jour.”

A few weeks later I found myself on a traverse of the Chugach Mountains with Huntington, an environment where he seemed to be fully in his element.

When we stopped for a lunch break our conversation wandered in and out of various topics, one being how we tend to exist in silos, ideological or otherwise.

Huntington suggested that the same thing happens within all the various scientific disciplines.

“Can we push now? Can we force ourselves into this zone that’s really not comfortable for a lot of scientists? Which is to say let’s get out of our individual areas of expertise.”

According to Huntington there’s a fundamental piece missing in the story about climate change. “What does it mean when we add it together? What does it tell us? So we’re telling one story.”

He even proposes there’s a benefit to “unlikely alliances.” Adding, “It involves a lot of

hard work in areas we’re not accustomed to. As in any other human endeavor you need personal relationships.”

Figuratively speaking, he suggests, “We need to learn to communicate in other languages.”

With the clouds passing in and out of the valley below us—a reminder of the value of perspective—Huntington offered an apt summation of the problem we’re facing.

“Is climate change the symptom of the failure to relate? If we as society or as a species can’t communicate in ways to solve problems like this... If it’s not climate change it’s something else.”

RINGING THE BELL

There is an art to science, and science in art; the two are not enemies, but different aspects of the whole. —Isaac Asimov

Professor Matthew Sturm is a geophysicist who is most at home in the cold world. A place most people understandably lack an affinity for but, paradoxically, what makes life on earth possible for all of us. The cold world is where he pursues his craft, but also where he finds his muse.

When Sturm talks about snow his entire demeanor becomes an impassioned part of his stories, conveyed with an element of imagination that makes you remember what it was like being a kid in your favorite elementary school class. An experience not unlike the first time you made paper snowflakes. Folding a piece of paper six times, forming a triangle, and cutting out a pattern with unique intricacies that were only revealed as you anxiously unfolded the paper.

In a similar way, Sturm sees the natural world with beginner’s eyes, and this carries through in his stories.

This same blend of curiosity often leads him to work in extreme places all for the sake of understanding how snow is changing, how it’s changing our environment, and how it’s affecting the people whose lives are dependent on it.

“These are the things I’m passionate about,” admits the bearded and affable, 65 year old who looks every bit the part of a quintessential Alaskan woodsman. He’s made a seemingly obtuse form of research his life’s work and, as a result, it has made him one of the world’s foremost experts on the cold world.

Sturm studies how snow is made, how it works, how there are dozens of general shapes of crystals reflecting how they were born and the environment in which they exist, but also a nearly infinite number of uniquely detailed snowflakes. How snow smoothes landscapes,

how it protects and insulates plants, and in turn makes some of those plants available to animals as food. And how the loss of snow in the Arctic, both on tundra and on sea ice, is leading to an exponential effect on warming.

Also an expert on climate change, it’s the one subject where his passion takes a more stoic turn.

“I expected to be in backwater science my entire career. But then climate change overtook me,” he says, admitting that he didn’t sign up to be a “climate scientist,” or worse, pigeonholed as someone with an agenda, other than simply wanting to do good science and live a private life in the interior of Alaska.

“Where are we?” he asks rhetorically. “Are we keeping ourselves optimistic by having this other perspective from geology? If you want to tell yourself it’s natural that’s fine. But I’m not sure how long that fiction is going to be maintained.”

Sturm is referring to the notion that warming isn’t anthropogenic in nature, but part of a natural cycle.

He cautions, “Because there’s ample reason to be alarmed, but it’s pretty clear that ringing the bell over and over again is doing nothing.”

During my first meeting with him we chatted over breakfast at Sam’s Sourdough Cafe, next to the University of Alaska Fairbanks campus where he works as a professor at the Geophysical Institute. A big omelet in front of him, he seemed oblivious to his food, and more interested in sharing his passion.

Our discussion began with the irony of where we were, both literally and figuratively—inside a classic American diner, discussing what seems like a classic American quandary: Most of us seem unable to grasp what we can’t see with our own eyes, even despite wide-reaching ramifications, despite overwhelming scientific evidence, and even despite consensus among something like 95% of scientists. The tendency to believe it’s not our problem if it’s not happening in our backyard.

“The climate is changing, people aren’t responding,” he says, proposing that it’s perhaps, “a problem for social scientists.”

Summarizing the predicament some scientists have found themselves in, he says, “As geophysicists we start out asking physics questions, when does it freeze? Eventually the historical perspective kicks in, *hey is the ice the same now as it used to be?*”

“Pretty soon, there you are,” he says. “You started thinking you figured out how something works and then you’re face to face with how it might be changing.”

“And you landed in climate change debate.” Sturm cautions, “There’s an existential risk

in the current situation. Probably little risk for earth. But there’s a true risk for people and we don’t know the extent of it.”

Meanwhile some say there’s an overwhelming interest among many political leaders to invest in the status quo—despite, or maybe because, warnings that the divide will only deepen along cultural, racial, social, and economic lines.

Sturm possesses an unfailing philosophical perspective on things, even with the foundations of his academic training.

“There’s an arc of people, there’s the ultra liberals: *I will save the earth by recycling plastic bottles. Or not using paper towels, or not using Pampers for my kids, or any number of things.*”

And he adds, “On the other end you have some guy saying it’s all bunk.”

“Across that spectrum sprinkle in some scientists,” he says, adjusting his spectacles like a sage professor.

“The public doesn’t understand scientists,” he says. “We are not what the public thinks. They think we’re rational rather than passionate human beings. But at the same time we’re not environmentalists either.”

A wide grin on his face, Sturm admits, “We find ourselves sometimes being consulted but often times being ignored.”

Two months after my first meeting with him I find myself back in Fairbanks, but this time at his home that he built, tucked in the shadows of a densely wooded birch forest in the hills north of town. I was there for dinner with him and his wife, who is also an astute educator.

Instead of vexing questions about climate change we talked for two hours about the early history of geophysical research in Alaska and Canada, a subject for which Sturm possesses great passion and fluency. He loves good stories as much as he likes telling them.

Accidents were as common as scientific discovery. A long list of names punctuated the discussion, the pioneering scientists who were all by default also highly competent mountaineers. Their style of expedition-supported research isn’t done as often these days, mainly because of the advent of remote sensing equipment, better helicopters, and reliance on satellites for communicating field data.

Ultimately I steered the conversation back to the subject of this essay, admitting that I was struggling with the arc of the story.

And Sturm offered this, “Find your own truth, look for the art in the story, because one thing is certain, the alarm story is not only overdone it’s boring.”

“There’s no one to move by ringing the bell,” he finally added.

GROUND ZERO

The climate that sustains life as we know it today lies closer to the freezing point of water, and much of modern civilization exists by virtue of a delicate balance between this climate and present snow and ice masses. We do not yet know enough about the causes of world climatic changes to be able to tell whether long sequence of Pleistocene glaciations has come at last to an end, or whether a fifth ice age still awaits us some time in the future. The answers to this question are hidden somewhere in glacier ice. —Austin Post, Edward Lachapelle. 1971

“It looks like a crime scene over there,” says Chris McNeil, pointing toward a steep section of the glacier that melted so rapidly all that remains is a giant scar. Dark earth, spanning a hundred yards wide, surrounded by blue ice.

I’m with McNeil and his boss, Shad O’Neel, both geophysicists with the US Geological Survey. O’Neel is head of the glacier research program at the Alaska Science Center. We’re standing somewhere near the middle of the Wolverine Glacier, a decaying body of ice tucked away between Prince William Sound and the Kenai Mountains.

As the two scientists are working they’re discussing how much the glacier has visibly changed in such a short time, as in significant changes over the course of a decade that the two men have been doing fieldwork on Wolverine.

Strangely, their remarks seem incongruent with the objective nature of their scientific work.

For the previous two days I observed O’Neel and his team of three scientists methodically taking measurements, making notes and calculations, surveying surface elevations, checking the accuracy of data loggers—all of which collectively paints a grim picture.

But the telling part wasn’t the science, it was their emotional response.

To be clear these aren’t ordinary individuals. They are so singularly focused on pursuing objective data that it permeates their existence. With the exception of the mountainous backdrop and their specialized skills to operate in such a dangerous place, watching them work is the same as seeing the scientific method unfolding.

But, as McNeil so eloquently put it, “I’m human first, scientist second.”

In September of 2018 I spent four days with these glaciologists as they did their fieldwork on Wolverine Glacier. Known as a “benchmark glacier,” research originally began there in 1966. The Wolverine was chosen because it represents the region in terms of ice mass, meteorological environment, and streamflow.

“The unknown, unknown. That’s what concerns me the most,” O’Neel told me, borrowing the infamous phrase from Donald Rumsfeld, former Secretary of Defense.

He was referring to one of his biggest areas of research, described as “Icefield-to-Ocean Linkages.”

To be more precise, the linkages “Across the Northern Pacific Coastal Temperate Rainforest Ecosystem.” This is the title of a paper he wrote along with twelve other researchers, published in Bioscience in March of 2015. In short, the abstract states:

Rates of glacier mass loss in the northern Pacific coastal temperate rainforest (PCTR) are among the highest on earth, and changes in glacier volume and extent will affect the flow regime and chemistry of coastal rivers, as well as the nearshore marine ecosystem of the Gulf of Alaska.

THE UNKNOWN, UNKNOWN

And the larger focus of O’Neel’s work, trying to piece together a story. “Glaciers are good at taking in weather and spitting out climate,” he says.

After a long day on the ice we begin descending toward the toe of the glacier. A steep icefall forces us off the glacier and onto an adjacent ridgeline. After navigating some difficulties we finally arrive near the bottom, in a deep gully strewn haphazardly with boulders and covered in glacial silt. It looks like Ground Zero.

“Two years ago the glacier was right here,” says McNeil. Then he points to the adjacent mountainside, a bare rock wall where a discoloration marks where the glacier once dominated the landscape. “It was up to there,” he says.

He was referring to the trimline, where the glacier affected the color of the underlying bedrock, once hidden beneath the ice. In other words, for centuries the Wolverine glacier remained in some state of equilibrium. And then something changed. It began disappearing, quickly.

Melting glaciers leave behind signatures of their demise. Among these, trimlines are evident next to many Alaskan glaciers, just like Wolverine.

We climbed back onto the glacier so the two scientists could complete the last of their work for the day. McNeil broke off to do some work on his own as O’Neel and I chatted.

We were about 500 feet directly above a lake at the terminus of the glacier. O’Neel started looking around, commenting that we were standing amidst an area that’s rapidly melting, and collapsing.

“This is new,” he said, a pensive look growing on his face.

As he studied the glacier, I studied him. Contemplative and deliberate, he surveyed the scene all around us, not saying a word. Then he slowly started shaking his head, followed by a big sigh, as if the glacier was exhaling through him.

“She’s dying,” he said.

Eventually McNeil joined us again and the two men began working together, silently.

The complexity of the geography around us, and the uncertain state of change, was poignantly reflected in the emotions and humanity of two scientists.

THE HUMAN CONDITION

It wasn’t the circumstances of Hubley’s death that concerns me most, but what his death says about our own humanity. When he sat down on the McCall glacier for the last time in the winter of 1957, we lost more than a good scientist.

Using a syringe from the team’s first aid kit, Dr. Richard Hubley, with a long career ahead of him, injected himself with morphine, committing suicide in the very place that intrigued him. He froze to death, alone. His work unfinished. His fellow scientists, a short distance away, completely unaware.

“When found, many hours later he lay frozen on the glacier whose secrets he had sought to probe,” wrote Walter Sullivan, the New York Times science writer who had spent time with Hubley on the glacier.

Hubley’s secrets died, too, along with the demons he wrestled with. His team members reported no indication of Hubley’s intention to take his life; all they knew is that he was “different” and “preoccupied.”

Climate change is a story full of metaphor, irony, hypocrisy, and dysfunction, and all that makes it equally as much about our own human nature, and the human condition. And perhaps a study in pathology. For I worry that the global crisis that’s been predicted has in many ways already arrived. But we’ve become numb, tone-deaf, and out of tune with people and our surroundings.

Despite how compelling and fascinating all my conversations have been with both scientists and Arctic residents, it was learning about the hidden details of Dr. Richard Hubley’s suicide that has haunted me most. One man’s last, desperate act. And his unfinished story.

Like the wind spinning that small anemometer on top of a remote research hut in the Arctic, all that was seen—the manifestations, and the aftermath. ■