FOOD Ed.

FOOD EDUCATION FOR CHANGE

UNIT 2: FOOD AND THE ENVIRONMENT

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Note to Teachers

As the lessons in this unit have stressed, humans' development and implementation of advanced technology have tended to distance us from nature and cause devastating environmental damage. Yet, it is worth asking whether we can put technology to work to enhance natural processes. The exploration in Lesson 20, which uses the fish farm of Veta La Palma as its example, reminds us that we can—as long as we listen carefully to local ecology.

Goals *In this lesson, students will*

- understand the state of the world's fish populations and the need to make considered choices when eating fish.
- learn that technology can be a valuable partner in farming with nature.

Objectives

- Students will use a short writing prompt to review the environmental consequences of industrial farming practices.
- Students will draw from texts in different media to explore the state of fish populations and the possibility of using technology to raise fish sustainably.

Materials

- Internet access and equipment to stream a video: Dan Barber's "How I Fell In Love With a Fish" at www.ted.com/talks/dan_barber_how_i_fell_in_love_with_a_fish#t-1112659
- Reading

L.20

MAN AND NATURE REVISITED

Please use this margin to notate how to best adapt this curriculum to your students.

Instructions

1. **FOCUSED FREE WRITE #1** (3 minutes): We love advanced technology in our culture and look to it to solve many of our problems. On the basis of what you have learned so far, what has been the outcome of using industrial technology to grow our food?

   Selective Share: With luck, students will point to pollution, soil degradation, climate change, and other such pressing problems, along with technology that makes our food less perishable like canning and freezing.

2. Remind students that the key failing of industrial agriculture is its desire to impose a plan on a natural system. An integrated system, by contrast, seeks to understand and work with a particular ecological system.

   Invite them to consider today's lesson as a way of thinking about how agriculture can use technology after (and ONLY AFTER) those who work the land understand it.

3. Introduce the example in question today with the TED Talk by Dan Barber, "How I Fell In Love With a Fish" (20 minutes)

   Barber offers great milestones in the logic and flow of the talk, but do not hesitate, if you have time, to show the video twice. There is a lot of information here and it is very good. Students will likely not catch all of it the first time.

   Distribute these questions before you show the video, or—if you show it twice—between the first and second viewing.

   1. Why does Chef Barber say he worries about keeping fish on the menu? (What is the state of fish populations in the world today?)
   2. Why did he fall out of love with the first fish he loved?
   3. What did he love about the second fish?
   4. What did he subsequently learn from the biologist Miguel about the farm, Veta La Palma, which produces it? What characteristics of that farm does he identify?
   5. How does Veta La Palma illustrate, for Barber, what the future of farming should look like?

4. Use the questions above to gauge students' understanding and the larger issues Barber raises (the problem of overfishing and the possibilities of producing our food differently).

5. By now, an astute student should be asking what all of this discussion has to do with technology. Distribute the accompanying handout: Barber, "The Heart is Not a Pump"

   If you are skilled at reading aloud, you might consider reading this text, asking students to follow along and to underline important words and phrases. Listening to you as you read clearly and deliberately as you follow the flow of the sentences will likely help them understand the text more easily.

   When you have read (or had them read silently, if you prefer), ask students to answer the following questions:

   1. What ideas does Chef Barber attribute to Rudolph Steiner?
   2. What does it mean, in medical terms, that "the heart is not a pump"?

L.20

MAN AND NATURE REVISITED

3. How does that idea translate to the pump at Veta La Palma? And what does that pump, for Barber, tell us about what farming can look like?

Ask students to discuss with one or two partners, and then share with the full group. Listen for gaps in their understanding, or issues they gloss over.

End the class with an open discussion, to air student thoughts and questions.

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L.20 Lab Supplemental

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WHEY STEAMED MUSSELS

10 students

Equipment List

- 1 colander
- 2 scrub brushes
- 8 cutting boards
- 8 knives
- 1 large pot with lid
- 1 induction burner
- 1 wooden spoon
- 1 cup measure
- 2 tablespoon measure
- 1 teaspoon measure
- 2 medium/small silver bowl
- 1 pair tongs
- 1 slotted spoon

Food Items

- 2, 2 lb. bags of mussels
- 6 cups whey
- 3 medium onion
- 4 cloves garlic
- red pepper flakes
- 1 bunch of parsley
- ½ stick butter
- olive oil
- salt and pepper

L.20 Lab

MAN AND NATURE REVISITED

FOOD Ed.

WHEY STEAMED MUSSELS

YIELD: 12-18 servings
(about 3 mussels per student in a 24-student class)

TOTAL TIME: 35 minutes

Ingredients

- 2 x 2-2.5 lb. bags of mussels
- 6 cups of whey
- 3 medium onions, cut in half and sliced thin
- 4 teaspoons garlic, minced
- 2 pinches red pepper flakes
- 4 tablespoons fresh parsley leaves, minced fine
- 4 tablespoons butter
- 4 teaspoon olive oil to sauté the onion and garlic
- Salt and pepper

Directions

1. Mussels—One NOTE: Very important. Rinse and SCRUB the mussels well under very cold water in a colander. For any opened mussels: tap with your finger a couple of times and if they do not close, then they are BAD (dead) and make sure to toss those ones out.
2. In a medium-large pot, add the olive oil and bring to a medium high heat. Add the onion, garlic, and chili flakes and sauté for 3 minutes.
3. Add the whey and mussels to the pot and reduce heat to medium and cover. Simmer approximately 7-10 minutes until the mussels begin to open.
4. Turn the heat off and add the butter and parsley and stir well. Don't over cook the mussels. You just want to make sure that they all open well.
5. Serve hot.

L.20 Reading

MAN AND NATURE REVISITED

FOOD Ed.

DAN BARBER
from
THE THIRD PLATE

Dan Barber, The Third Plate (NY: Penguin, 2014), 265-270.

Use the space below to note key ideas, themes, or surprising takeaways from the reading.

In this excerpt from *The Third Plate*, Chef Dan Barber contemplates the role of technology at the Veta La Palma fish farm, an agricultural system that works with—rather than against—nature.

Rudolf Steiner, the Austrian philosopher and educator, was once presented with a problem. A group of farmers, alarmed by their experience with "mineral manuring," or chemical fertilizers, and worried about how these new practices would affect soil health, asked Steiner for advice. These were prescient farmers; the year was 1924.

In response, Steiner provided a series of lectures and follow-up lessons that became the foundation of what would later be called biodynamic farming. Farms are living organisms, he explained, and they operate in the greater organism of earth. . .

[I] thought of Steiner as we stood before Veta la Palma's famous pumping station that afternoon. Miguel described the pump as the geographic center of the farm, moving over 250 million gallons of water a day. It has the ability to open, partially open, or close, depending on the water and weather conditions. It was impressive to see up close, and Miguel's enthusiasm was affecting, but I found myself distracted by the meaning of what he described: the pumping system doesn't pump so much as assist the water. When the tide is up, water flows in, and when the tide goes out, the water returns to the river. Because of the force of the tide, this would happen with or without the pump, as it happens in every estuary in the world. The difference is the need to elevate the water into the irrigation canals. From there gravity eventually pulls the water into the fish-rearing ponds. The pumping station's job is to automatically adapt, evaluating the changing levels of water and distributing it accordingly.

"It's a continuous movement, so the pumping station works all day long, year-round," Miguel said.

Which is why Rudolf Steiner came to mind. A student once asked Steiner what he believed the betterment of humanity required. He gave three answers, and it's the last one that stuck with me. Steiner told the student that in order for human beings to improve and make true progress, they needed to understand that the heart is not a pump.

[Barber thought:] Really? If the heart doesn't act like a pump, what does it do? . . . [I]t wasn't until I stood at the pumping station—at what Miguel called "the beating heart of Veta la Palma"—that I began to understand its significance. Steiner wrote that science "sees the heart as a pump that pumps blood through the body. Now there is nothing more absurd than believing this, for the heart has nothing to do with pumping the blood."

L.20 Reading

MAN AND NATURE REVISITED

. . . Steiner was right. For one thing, when blood enters the heart, it is traveling at the same speed as when it exits. It slows down as it heads to the smaller capillaries to transfer nutrients, then moves to the venous system, a highway of larger and larger veins that eventually lead back to the heart. As it approaches, the blood speeds up again. The heart acts more like a dam at this point, trapping the blood and holding it in its chambers until they're filled, which is when the valves open and the blood is released, resuming the cycle.

As Steiner explained, "The circulation of the blood is primary. Through its rhythmic pulsations—its systole and diastole—the heart responds to what takes place in the circulation of the blood. It is the blood that drives the heart and not the other way around." The heart doesn't pump the blood. The blood pumps the heart.

So what does the heart do? It listens,. . . and it acts like a conductor, controlling the rhythms of cellular management. A scientist might call this maintaining homeostasis. Either way, the idea is that the heart serves at the pleasure of the cells, not the other way around.

Veta la Palma's pumping station works the same way: the pump activates what the tidal action from the Atlantic and the powerful Guadalquivir River (the largest vein entering the farm, fed by thousands of smaller, capillary-like rivers) demand. It listens as the water "pumps" itself through the system. The pumping station is programmed to react, instead of control, the flow of water. And the distinction is not small.

The first part of the distinction is that Veta la Palma's technological pursuits are in the service of a better-functioning natural system. As Miguel later wrote to me, "It's about technology working, side by side, with ecology. Without this engineering project, we biologists would not be able to guarantee the viability of what we grow, nor its 'added value' (i.e. the birds, since in summer Veta la Palma is the only place there is water). And without our biological and ecological knowledge, the engineers would never have been able to build such a sophisticated hydraulic system."

The second part is, to borrow a phrase from Steiner, spiritual, and that takes more time to decipher. Steiner was one of the earliest writers to question the so-called mechanistic approach to science, which viewed the workings of the environment in separate parts—machinelike more than lifelike. . . .

The core of Steiner's thinking was that biology is a lot more complicated than that. It is decidedly not linear. He didn't see simple cause and effect applying in a natural system. Just like Miguel, Steiner valued relationships, and in that sense he was a kind of complexity theorist, seeing the workings of nature as continually in flux.

"Steiner said what the science community at the time wasn't ready to hear," Fred [Kirschenmann] told me once. "Nature doesn't allow you to impose one idea, or one solution, because it inevitably changes the game." The only way to comprehend nature was to recognize an inherent spirituality in its workings. It was the spirituality that always rubbed me the wrong way. And yet, as I stood in the middle of Veta la Palma, with the backdrop of the enormous pumping station, Steiner's message began to seem more right than wrong. Today the

L.20 Reading

MAN AND NATURE REVISITED

mechanistic worldview is mostly old news. We don't, for example, hear talk anymore of the search for the one gene that will cure heart disease. Or any other disease. For much of the past half-century, the prevailing view was exactly that: one gene, one trait. Identify the gene, suppress it, and solve the problem. We now know that to be wrong. Genes don't act independently of one another. What's most important is the complex set of relationships that determine how they get turned on or off.

And it's not just the medical sciences that have moved on. Businesses, government agencies, and educators have moved away from erecting silos between departments, encouraging more creativity under the logic that in novation prospers when ideas can connect and recombine. It's all very logical, really, except that most of agriculture is still mired in seventeenth-century ideology. Diversity has been replaced by specialization; small, regional networks have given way to consolidation. Farming has been broken into component parts in pursuit of growing more food.

One hundred years ago, Steiner saw this thinking as folly. To break nature into its component parts to solve problems, as you would go about repairing an old watch, is to go about it in entirely the wrong way. That isn't how biological systems work. It's how computer programs work.

What's become clearer to me, after spending time with farmers like Miguel, Klaas Martens, and Eduardo Donato, is that farming with nature's frustrating complexities—even, or especially, with supposed enemies of the system—is inherent to their success. True, their systems are "artificial" (Veta la Palma's pump-moderated estuary, Klaas's intricate crop rotations, Eduardo's manmade dehesa), but human intervention, in each case, is in service to the ecology rather than in opposition to it. They embrace the diversity of the natural world; they work within the constraints of nature—and, in the end, benefit from them by producing food with great flavor.

I often think back to what Miguel admitted to me in the first hours of our meeting. It was so true, and so humble-and, when you think about it, so Steineresque, with its hint of spirituality. He said that most of what happens between the species at Veta la Palma he couldn't see. "But," he added, "I am absolutely sure they are allies of the system."