

STEPHEN

CARPENTER:

What I wanted to demonstrate is how this press works. I want to show how to make a proper water filter. And this is a ceramic water filter that I'm going to create here. And that's essentially a focus of the first talk. This is bisque-fired filters made with clay and sawdust. Dry clay, dry sawdust, about 50/50. And when the sawdust burns out, it leaves pores.

Now, the clay is naturally porous, but the sawdust allows for more porosity, and so the water can flow through. If you have water that's contaminated with microbes and pathogens that might create things like cholera, E. coli, Giardia, you can put that water into this filter. It will filter about one to three liters an hour. And that water is rendered about 95% free of those contaminants.

If we add a small amount of colloidal silver to the filter by brushing it on-- usually, it's a less than a gram with about 500 milliliters of water. That silver acts as a natural antimicrobial and will render inert approximately the remaining 4 and 1/2% to 5% of the bad stuff that's in that water. So this is one of those approaches that allows us to have potable water or adequate access to clean water.

A few years ago, I was working with some undergrad engineering students. I said, look, I have this dilemma. Here's the situation. We have this big press that's used conventionally to make these filters, but it's really tough to take with me on the road. Can you make one that fits in a suitcase? They said, yeah. Can you make one that makes the same size filters? Yeah. Can you make one that doesn't cost any money or costs as little as possible? They said, well, maybe.

And they did it. This is the filter press. It was collapsed earlier. I assembled this. And they made this out of repurposed materials, but also, some of the material I gave them, which was this bell, the male and female molds here. So I'll demonstrate how this works to make a filter. Usually, again, the filters are made on a full-sized press, but this is a smaller press.

This is both the prototype and the final product and the only one in existence. Cool thing about this is one person can operate it. Usually with those big presses, it's easier if two people operate it. But one person can do very well. So this is a male mold. This is essentially very lightweight steel. So we have this bell form. And what we're going to do is put the clay in the middle, and we'll make the filter this way.

So this is the metal mold, the bottom of the mold. I'm going to-- thank you-- put this plastic down as a release agent. Because the clay will stick to the metal. It doesn't like to stick to the plastic. And I have this bat. It has a bevel in it, approximately the same angle as the bell. Then, I'm going to put this clay--

So I'm going to put the second piece of plastic on, and then I'll put this top part. What's interesting is that the original traditional approach to these larger presses used concrete molds, and then they moved to lighter weight metal molds. And so this is the same exact mold that one would find on a larger press. Now, this is the part that sometimes gets tricky, because you've got to make sure both of these sides are latched down.

Take this arm and tighten up the jack. And then, with just a simple-- this is a fun part. I like to say you have to get up to get down. You have to push this thing up in order for it to have resistance and push back down. At this point, I am going to release the pressure. All right, we'll tighten this back up.

Certainly, this machine, this press, portable press, wouldn't necessarily work well for a proper production facility where you want to crank out lots of filters in a day or in a week. But certainly, to establish a facility in a community that needs clean water using this technology, we can use this press to create filters very quickly and give ourselves a baseline of not only the clay but how the filtration works. Lift this back up. Take the bell off. And there's our filter.

Just takes a little bit of cleanup at this point. Again, I'm using my thumb just to pull some of this extra off, but I could certainly use-- and this is what you would do in a production facility, would be to take a clay tool and to clean this up, as well. And then, because this bat is wider than the base, I simply lift, and there's the filter. I can lay this-- place this down on a shelf in the studio or in the facility.

Another worker would clean it up, smooth up some of the edges, perhaps. Stamp it with a date and a number so we can track the way that it operates. We let it dry, then we fire it. We put it in the kiln. We fire it to about 866 degrees C. And what happens then is the sawdust burns out, which then creates a more porous vessel that allows the water to flow at a more rapid pace than it would if it wasn't as porous.

This is ready to make another filter. I could put plastic down, another bat down. We could continue to make filters as long as we had clay. So with one person, that was, what, about a

10-minute time frame. With two people, you could move much more quickly. But the reason I wanted to demonstrate this to you is to show you, in real time, what it takes to create a water filter.

What if you designed houses, what if you designed shelters, what if you designed access to water as if you really cared about people getting it? Not that you cared about making money from it, or that you were interested in fame, or that you were just doing it to do it. What if you gave a damn about the situation? What if you cared in more direct ways? What would that look like?

In ways that would be affordable to people who need it, but also appropriate in terms of appropriate technology. The idea that materials and practices and processes that allow for things like shelter and food and water access to happen do not complicate a cultural set of rules and practices. It's appropriate for the culture. It's appropriate for the situation. Thinking about culture as the way we do things around here. So does the technology interrupt the way we do things around here? Does it pose confusion?

So this is the gentleman who invented, or is credited with coming up with, the approach, Dr. Fernando Mazariegos, who was from Guatemala. And as a first response to natural disasters, Mazariegos thought if we had this porous vessel that allowed for water to flow through, that contaminated water to flow through at a fairly rapid pace, we might be able to produce adequate access to clean water, to potable water, after natural disasters.

And so Mazariegos then was contacted by Ron Rivera. Ron was working with Potters For Peace at the time. This was in the late '80s, early '90s. And Ron learned the process and started setting up a water filter production facility through Potters For Peace. Met Ron Rivera a number of years ago at a conference. And several months after I met him, he passed away. He was working in Nigeria to help a community set up a water filter production facility so that they wouldn't contract malaria and would not die from malaria.

Ron came back from that trip and died from a very rare and difficult strain of malaria. So he gave his life so that others could have clean water. And whenever I give a presentation, I always think of that very special moment meeting Ron. But the idea is that it's possible for this technology to be passed along to folks so that they can use it to move throughout the world and through communities to help other people.

This is a cross-section. This is a drawing that Manny did of the filter inside the receptacle. You

see the addition of a spigot and a lid. And these are two important components. You need a spigot to get the water out and a lid to keep hands and other things entering into the filter. Contamination is a big issue, right?

These filters, as you see here, if they were sitting on a counter in a kitchen, you can put anything in. Your hands can touch them. External things could touch them. And you can contaminate the water. Even the water that is flowing through can get contaminated. So a lid is necessary.

I don't know if you can hear, but this one is dripping quite loudly now that the water is flowing. We have some dirty water that we were using earlier. And we filled these filters up. I'm going to lift this one up so you can see it. You can't see the cross-section. This is the cross-section. Here's the spigot. I don't have the lid, but I'll lift this up. You'll notice the bell shape, and you should see the water dripping from the filter.

You see that? And if you come up later, after we give this little chat, you'll be able to see the clean water that's in there. So this is a point-of-use water filter. It's placed in the point in which it will be used in the home, usually in a kitchen. And the idea is that you would fill it up in the morning-- in the evening, I'm sorry, before you go to sleep. It will filter through the night, and in the morning, you have water for cooking and drinking. You fill it up again sometime during the day, and then you have another batch of water in the evening.

So, again, point-of-use water filters. These filters, again, the technology is the same. The idea is the same, but because clay and needs are different in different locations, various organizations have set up facilities under different names, but using the same technology, the same idea. Because the need for clean water is a global need. The right to access to water is a basic human right.

So this little girl and the other two children in the image are drinking water like they do every day. I can go right to that water fountain down the hallway and get a drink of water, or my water bottle is here somewhere. I can drink out of that. Many of you have water bottles. This is the same water that you see in the background. This water is the same water where the cows have defecated, where people have thrown away whatever it is they're throwing away in that water. This little girl is in Honduras.

This gentleman is getting water for his family, his well. And that box has a little opening on the

face, on the plane facing us. He reaches his hand in, puts a few coins in there, and the water comes out of that long tube. Water's been sitting in some sort of receptacle reservoir underneath. He fills up the containers in the back of his truck and then drives those containers home. Then has to figure out how to get the water into his house. Then has to figure out how to make sure the water is clean and safe to drink. This gentleman is in South Texas, outside of Laredo.

Half a million people do not have utilities, paved roads, and housing that's up to code in South Texas, from El Paso to Brownsville and 150 miles north, that green swath that you see in that map. That's South Texas. Half a million people. They don't have adequate access to clean water, either. And so my colleague at Texas A&M, Oscar Munoz, is the director of the Colonias program and works with communities along that region.

Social practice and public pedagogy, linking those two, this notion of intentionally disruptive responsibility. Social practice being a term that grows out of a number of moves in contemporary art, where it has been theorized by people like Clara Bishop and Pablo Helguera and others to think about the way in which artists or artistic practices intersect with social issues and conventions from other disciplines to make positive change or to enact change through intentional modes.

Public pedagogy, very much like what we did this morning. We were out, essentially, on the sidewalk-- or we were on the patio that overlooked the sidewalk-- mixing clay and sawdust in preparation for making water filters. And people stopped and said, what are you doing? Right there, you have developed a relationship, this interchange, by asking a question and responding and this back and forth and back and forth. There's some learning that goes on in both directions. And talking to folks about the water filters through a public forum in a public space is one form that we might consider public pedagogy.

When I moved it to Penn State, I decide to put a name to these performances-- collaborative creative resistance. I mean, Larry and I were talking about titles. And sometimes, the title's enough to tease and pull folks in. But the idea of how might we collaboratively work together to resist those hegemonic forces or to disrupt what others might find acceptable.

So with a small grant from the Institute for the Arts and Humanities, I did a performance in front of the Palmer Museum of Art. So there's a proximity to the art museum. So maybe it's more art-like because it's closer to the museum? I'm not necessarily saying that. But it was a

wonderful open space that allowed for the middle of campus to stumble upon it. That was a Friday afternoon in the middle of April. Set up the press. Started making filters. People stopped by.

Students in art education and in the School of Visual Arts volunteered to sieve sawdust and to mix the clay. Although I knew this would probably happen, I didn't count on it happening to the degree that it did. In the background of this image, and in the very foreground, you probably see people who are a little younger than what you might expect to see on college campuses. These are children who came from the local daycare center on campus and from the local elementary schools.

The daycare folks knew I was going to do it, because I had talked to them. But the kids from the elementary schools, their teachers and the kids thought they were going inside the museum to see art. But when they got off the bus, they saw this guy with a fedora wedging clay and using this big guillotine-looking machine in the middle of campus. They'd rather stay outside and talk to that guy. We had wonderful conversations about adequate access to clean water.

Former student Sam Bachmann, who's a ceramic artist, dual degree studio art and art education. You can have class anywhere. You can engage education anywhere. You can have learning anywhere. Education is a relationship. Teaching and learning is a relationship that's negotiated between multiple parties. And there's as much learning going on from whoever thinks they might be the teacher as there is from folks who might initially think they're the learner. Everyone in that relationship is learning and teaching simultaneously.

[BIRDS CHIRPING]