

## Episode 7: The Natural Building Omnivore

Ava: Last episode we took you through the basics of hemp/lime building. We learned that you can put hemp, lime and water in a bucket and build a wall. But that's just the very beginning of starting a plant-based building industry.

But before we get into that, a quick housekeeping note. Much has changed in the world since recording the first part of our season and our format is going to change a bit too. From now on, there will be two ways we deliver Trace Material. 1, in the narrative style that you're used to. 2, we'll be introducing "Trace Material: Talking Shop," which will be more free-flowing conversations with folks in the hemp world.

And as one last note, joining me as co-host today is Burgess Brown, who has been behind the scenes, but is now stepping into the bright lights and glamour of a socially distant at-home audio booth.

Burgess: Hi, Ava! I'm excited to be joining you from my bedroom closet.

So this episode we're going up to the Great White North to take a peek at the hemp industry that has been bubbling up there for a while. Canada legalized hemp in 1998 and immediately, people began experimenting with at least a few hundred of those thousands of purported uses.

Ava: To understand what's happening in Canada, we reached out to Chris Magwood, who's been working in the sustainable building industry there for over two decades.

Chris Magwood: We think we've built the greenest home in Canada.

Burgess: Welcome back to Trace Material.

Chris Magwood: My name is Chris Magwood and I work at the Endeavor Center, which is a sustainable building school in Peterborough, Ontario, Canada. And we focus on teaching people how to build a zero-carbon zero-waste zero-toxin buildings.

Ava: Now, one of the first things you have to know about Chris is that he isn't only a hemp/lime builder. Chris works in a long tradition of plant-based building. Until about the beginning of the 20th-century people built with the materials that were around them - and those materials were often plants!

Chris Magwood: I call myself a natural building omnivore, so I'm not completely attached to any one material.

Burgess: And to that point, Chris didn't burst into the sustainable building world with hemp in mind. His earlier projects used a material that I'm sure you're familiar with: Straw.

Ava: Back in the nineties, Chris and his partner started researching sustainable building practices, and stumbled upon straw bale building. At first, it seemed too 'out there' and maybe even laughable.

Chris Magwood: Unlike a lot of the other things we are researching, it seemed kind of outrageous. But then for every question that we had about it, there was actually a really good answer. And so rather than it being a joke, it sort of ended up being the thing that we found, you know, the most sort of attractive of all the options that we had come across. And so we just dove in and built that first house.

Burgess: Chris and his partner were reading about and basing their work off of the strawbale houses that were built in the Great Plains states from the 1880s to the 1920s by white settlers.

Chris Magwood: A lot of them had very early versions of the horse-powered stationary balers. And so they literally were bailing this stuff to feed their animals. But somebody, you know, both clever and desperate looked at that at that sort of big fuzzy building block. And decided that that might make a good home. Scattered throughout that area of Nebraska, there are, um, a whole bunch of, still existing, still inhabited straw bale homes.

Burgess: Strawbale homes don't look very different from traditional homes, as Chris explained, the strawbale is packed into the wall and then sealed with plaster and paint.

Chris Magwood: Straw bale construction is literally kind of taking the rectangular small rectangular bales of straw that doesn't really have any food value, and quite often, no real value, on the farm at least in the quantities it's grown in. And so that we basically take those bales of straw and use them as large insulation blocks that we use to build the walls of homes and commercial buildings from.

Ava: And that sounds a lot like the way we've described hemp/lime, right? Both hemp/lime and strawbale are used as insulation. Chris was first introduced to building with hemp as just another form of strawbale when hemp was first legalized in the late nineties.

Chris Magwood: You know, it wasn't really on my radar until literally this farmer Grant Werecroft who lived down the road from me, phoned me and said, "Hey, I know you're making straw bale buildings. I got a barn full of hemp straw bales. Do you want to come and take a look?"

Burgess: Chris's neighbor Grant was a very early hemp farmer in Canada, but unlike Chris, he didn't get involved because he was looking for sustainable solutions to modern problems. Instead, hemp kind of found him.

Chris Magwood: When I actually went to visit him, he was definitely not a, you know, there, there's a certain person that's very interested in hemp and he wasn't particularly as a farmer, he is just, you know, running a small mixed farm. He's the fourth generation on that farm. The early crop in that area was hemp. And then when hemp was illegal, they started growing other things.

But both Grant's dad and Grant spent most of their farming life trying to get rid of this feral hemp that just kept receding and kind of coming up as a weed in their fields, in their ditches, all around their barn. And so when it became legal to grow hemp, Grant's take wasn't, you know, he wasn't excited about it so much as like, Oh, hemp has all this potential. It's just like, "I've been trying to kill this stuff my entire life and now somebody might pay me to grow it."

Burgess: So using Grant's hemp stalks, Chris and his partner started playing around with other techniques beyond using hemp bales. Now, in the late nineties people in Canada were just figuring out how to farm hemp... so using it as a building material was a really wild idea.

Chris Magwood: You know, we just started playing around with, first of all, how do you, you know, chop this stuff up. So using different machinery on Grant's farm and then from the straw bale building that I'd done, we work a lot with lime and lime plasters so I had a pretty good notion of how lime worked and what types of lime there were. Based on that we started just messing around with recipes.

Ava: But the heyday of hemp growing in the early aughts in Canada didn't last long. And so, Chris, who's dedicated to using local materials, has diversified.

Chris Magwood: One of the limiting factors in how much hemp I've built with is in the late nineties, early two thousands, there was a bit of a hemp growing boom because that's when it became legal to grow industrial hemp in Canada again. And so for a while we were using hemp a lot. And then the vast majority of those farmers within a few years stopped growing hemp because the processing facilities and sort of the uptake of the products they were trying to grow for never materialized. And so it stopped being a feasible crop for them. And so suddenly it went from being, I could go get these hemp bales or this chopped hemp from a farmer who lived 10 minutes down the road from me to, Oh, now I'm trying to order hemp from, you know, Western Canada or something like that.

Burgess: Chris is certainly not someone who is stuck in his ways, so the loss of locally grown hemp didn't deter him, it only pushed him to innovate. Recently, he's started working with sunflower stalks. Yup, you heard that right, he's making buildings out of sunflowers.

Chris Magwood: One fall I was cleaning up our garden, which had a lot of sunflowers. And I was cutting down, you know, these dead stalks in the fall and I, you know, chopped the sunflower down and I took a look at, at it and I was like, wow, if I didn't know better, you know, if I was just looking at the core of this plant, I would think I was looking at hemp.

Ava: Chris described himself as a 'natural building omnivore.' He wants to use local, healthy, and sustainable ingredients. In our conversation with him, he highlighted the importance of flexibility when choosing materials. There isn't a one size fits all answer.

Chris Magwood: I think if and when hemp scales to the point where there's a lot of hurd around people living close to that should use that for building. And if you live in a sunflower growing area, there's no point in importing hemp from the other side of the country if there's sunflowers

in your backyard. So I think that's where that regional appropriateness kind of comes into play. And if not sunflowers or hemp, there's probably some other, you know, woody plant stem that's, that's growing there.

Burgess: Scale really is key here. Modern plant-based building in the US is currently a boutique industry. Plant-based builders construct one-off buildings for clients who are dedicated to sustainability. But what would it take for this boutique industry to become mainstream and accessible? Chris says we have to look at every part of the supply chain.

Chris Magwood: If it's not, you know, a whole lot cheaper than essentially you're asking me to change everything I do to make the same amount of money, where's the incentive to do that? At every stage in the supply chain that that question kind of keeps coming up not with that it's not practical or the right thing to do from an environmental point of view, but it just, it lacks the kind of financial model that we're used to in a sort of industrial society.

Ava: So is there a middle ground? Is there a way to maintain a dedication to environmental sustainability and human health, while working at a scale that makes hemp/lime accessible not just for homeowners, but for even affordable housing developers? We, and others in the industry, think so. And it starts with practicality. Chris points out that we can't ask builders or architects or developers to change everything they are doing, so we have to find a way to make hemp/lime fit into existing building and construction systems. Chris currently mixes hemp/lime on his job sites and pours it in place. We think if there were pre-cast hemp/lime products for sale across the US, they might find their way into a wider variety of homes.

Burgess: There is a caveat here, as Chris mentioned there was a serious dropoff in Canadian hemp supply in the early 2000s. Farmers just stopped growing it because the local processing facilities did not materialize. We saw early signs of US processing problems too when we visited Harrod's Creek Farm down in Kentucky. Sorting out the supply chain is going to be key in ensuring that hemp/lime products are viable in the US.

Ava: Next time join us for our first edition of "Trace Material: Talking Shop." HML Co-founder Jonsara Ruth will be talking to Cameron McIntosh about hemp/lime building in the US, and how it can go from boutique to mainstream.

Burgess: Trace Material is a project of Parsons Healthy Materials Lab at the New School. It is produced by me Burgess Brown, Ava Robinson and the HML team. Thank you to Chris Magwood for lending his voice and expertise to this episode and thank you to Friends of Healthier Materials who make this podcast possible. Our theme music "Rainbow Road" by Cardioid. Additional music from Blue Dot Sessions.