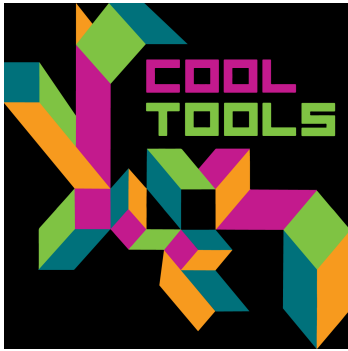




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This week Laura Welcher joins us. Laura is a Linguist, Director of Operations for the [Long Now Foundation](#) and volunteer at the [Global Lives Project](#).

Mark Frauenfelder: Welcome to the Cool Tools Show. I'm Mark Frauenfelder, editor-in-chief of Cool Tools, a website of tool recommendations written by our readers. You can find us at cool-tools.org. I'm joined by my co-host Kevin Kelly, founder of Cool Tools. Hey, Kevin.

Kevin Kelly: Hey, it's great to be here.

Mark Frauenfelder: In each episode of the Cool Tools Show, Kevin and I talk to a guest about some of his or her favorite uncommon and uncommonly good tools they think others should know about.

Our guest today is Laura Welcher. By training, Laura is a linguist who specializes in the documentation of endangered languages and the promotion of the world's linguistic diversity.

She's currently the Director of Operations for the Long Now Foundation, a non-profit organization working to encourage societal long-term thinking in the framework of the next 10,000 years. At Long Now, she also directs the Rosetta Project, which is building a digital archive of all the world's languages and an analog back-up of it that can last for thousands of years.

In her volunteer work, she is currently president of the Board of Directors of another non-profit, the Global Lives Project, that is building a video library of human life experience.

In her spare time, she enjoys playing a variety of instruments at a variety of skill levels, and engaging in activities that merge the application of cool tools for the outdoors such as ham radio, running, biking, hiking, snowshoeing, and plein air painting. Hey, Laura, you sure do keep busy.

Laura Welcher: I sure do.

Kevin Kelly: Yeah, good day, Laura.

Laura Welcher: Good morning, Kevin.

Mark Frauenfelder: Good morning. So just out of curiosity, you play a variety of instruments. What are those instruments?

Laura Welcher: Well, the one that I've played all my life, my whole family pretty much played the piano. My father put his way through college by playing at a German drinking establishment in Detroit, so he was a piano player. My brother and I grew up playing classical music, and so there was always people playing at the house.

I just love music. I love a whole variety of music and I dabble in other instruments, many of which I wish I could play better, like the accordion. I love the accordion, the keyboard version of it, ukulele. My husband is a guitar player, so there's lots of music in my house and I like to hang around with people who play music.

Mark Frauenfelder: That's great. Actually one of the tools that you recommend is a book called The Family Piano Doctor. Why don't you talk a little bit about that?

Laura Welcher: Yeah, well I was thinking about the tools that I want to talk about today and I thought I wanted to talk about things that seemed really obsolete. They should be obsolete in the modern world, but yet they have value and we continue to use them.

One of those is, you know I currently have a digital piano. I have a small place in the Bay Area and so I don't have room for a large piano and a good one is expensive. But when I was younger and I didn't have much of any money to spend on an instrument, I found a very cheap piano. It was an upright and it was so unremarkable I could not even tell you what the make of it was.

I managed to get it home. I think the deal was basically if I could move it I could have it. I got it into my house and it looked like it was in good shape, but the person hadn't maintained the tuning in about 10 years. This was in Chicago and so you know, you turn your heat on and off and the weather changes really effect an instrument that's made out of wood and metal like that quite a bit, and so it was really out of tune.

I think I had it tuned once, but I lived in Chicago too and so I knew I would have to maintain it over time. I thought, "Well, why don't I learn to teach myself how to do this?" I don't have perfect pitch, but I've played the piano for a long time and I have a pretty good pitch, and it seemed like a really fun and interesting thing to learn how to do.

I got myself this book, which I currently don't have a copy of. It's such a great book I loaned it out to a friend of mine after. You know, once you learn it you don't really need the book anymore.

I learned how to tune a piano using that book and as far as I know you can't even get it in digital. The book isn't available as a Kindle book or anything. It's still paper, which seems very appropriate for it.

You get a few inexpensive tools. There's a tuning wrench that you use, there's a couple of soft wedges that you use to stick between the keys and a felt that you can poke in between the strings of the keys and a tuning fork. Usually, an A is where tuners generally start.

Then there's a method to do this where you can just do it all by ear. A lot of people who tune pianos, modern professionals, will use an electronic tuning instrument. That is great, but I didn't have one of those and I couldn't afford one of those and I thought, "Well, you know, I would like to learn how to do this by ear."

The thing that's cool about it is that you don't need any special skills, really. You just need to have a reasonable sense of pitch. You need to know what intervals are and you have to have these basic tools.

Mark Frauenfelder: That sounds great.

Laura Welcher: Yeah, the method for doing it is really straightforward and you can learn some really amazing things by doing it. For one, the keyboard, the modern piano keyboard doesn't use perfect intervals. A perfect interval is like a fifth where there's a pretty straightforward ratio between the frequency of the two notes.

A fifth is I think 3:2 and a perfect fourth is 4:3 and when you play those intervals they sound really great to the human ear. It's a really fun exercise actually to try to tune your piano to perfect fifth.

If you start, if you know the circle of fifths it's kind of a way you work around a whole sequence of pitches by fifths. If you do that when you tune a piano in perfect fifths, by the time you get around to where you started from back to let's say you're starting with A and you work around, you get back to A, the last interval is going to sound terrible because you don't have a perfect fifth.

That interval is called a wolf interval. The solution to figuring out how to get rid of that problem basically divides our modern system of keyboard tuning, which is the basis for most other modern instruments as well, of

equal temperament where there's an equal interval between all of the pitches and that allows you to transpose things between keys.

Kevin Kelly: Wow. One of the questions is, I understand that when you were young and didn't have much money to use a tuning fork, but some of these little electronic tuners like the ones for the ukulele, they're like, I don't know, \$19 or something and they snap on to the neck. Wouldn't there be the equivalent these days of little electronic gizmos that you could use that'd be inexpensive? Have you looked at those?

Laura Welcher: Probably, but back when I was doing this, wow, did I have the Internet? I don't even know if I had the Internet to find out about such things. I just basically did what this book said to do, but I expect that there are cheap tools out there to do it and looking around to see how people are advising people to learn how to do it online.

I see that it's often recommended that you use a tuning fork, but I kind of like the idea of you travel lightweight, you have a little tuning fork in your back pocket and you can self-restore pianos.

Kevin Kelly: That's fantastic.

Mark Frauenfelder: Yeah, I think it's really interesting ... I would've guessed you needed a tuning fork for each key, so you'd need like 88 tuning forks. So you have to kind of depend on your ability to discern a note up or down from the A, is that what it is?

Laura Welcher: Yeah. You just need to know, if you learn any instrument you learn what the keys are, C, D, A, or C, D, E, F, G, A, B, C, and you learned the sharps and the flats and you learn basic intervals like what a fifth is. A fifth is like if you sing Twinkle, Twinkle, Little Star. Twinkle, Twinkle, Little Star, you know, the first two notes are a fifth.

If you start with an A and you go down a fifth, you can hear perfect interval because it sounds great. When you're doing the tuning by ear, what you have to do is you make your fifths a little bit flat, you make your fourths a little bit sharp and the way you know you're doing that is you're introducing a slow beat so it'll sound like wa-wa-wa-wa-wa when you get that interval tuned to be that equal temperament.

Kevin Kelly: I think I need the electronic version.

Laura Welcher: It's really fun to learn. It's kind of a neat thing to have in your back pocket and then if you go to a party and you play that game which is Two Lies and a Truth, then you can say, "Ask me, can I tune an engine, tune a piano, or tune a fish?"

Of course, you have to throw out the tuna fish because nobody can tune a fish. Then they look at you and they're like, "Can this person tune an engine or can they tune a piano?" They usually go for the engine.

Kevin Kelly: Yeah, exactly. I would.

Laura Welcher: I think that's probably more [crosstalk 10:10].

Mark Frauenfelder: I think that's fascinating.

Kevin Kelly: So the book is called The Family Piano Doctor?

Laura Welcher: The Family Piano Doctor.

Kevin Kelly: Okay.

Mark Frauenfelder: Okay. Let's have you talk about your battery powered, hand-held ham radio.

Laura Welcher: Oh, yeah. This is another tool which I think should be obsolete. If you carry around a cellphone in your pocket, why on earth would you ever need a ham radio, especially if you have to be licensed to use it?

Kevin Kelly: Especially one that you have in your pocket.

Laura Welcher: Yeah, well you know, a lot of people think that ham radios are really big and you can get desktop versions that are huge. The one that I have, that I've had for several years, it's called a Yaesu VX-8DR. That's the model and it's quite small. I'm a small person, I have a small hand and it fits really well in my hand and you don't need this crazy long antenna if you're doing local communications.

I think all of the really cool stuff you can do as soon as you get the basic license, which is a technician license, you can do with a really small ham radio. You can do some interesting things locally.

One of the things that I think is really great about it, if you get your license you can start using a couple of the popular bands, which is, it's usually called 144 and 440, and that allows you to talk to people who have other ham radios using a set of designated frequencies.

I use it to talk with people around the Bay Area. My husband and I both have ham radios and we've established frequencies that we would call each other on in case of an emergency because we work across the bay from each other, so if there was an earthquake or something like that it would be tough for us to be able to get to each other quickly and you kind

of want to make sure that somebody is okay in that kind of a circumstance.

Actually, ham radios have a really important function in emergencies as well because there are all of these informal groups that practice what are called directed nets. A directed net uses an agreed upon frequency, it can be simplex, so just you know, we're talking sort of point to point, or it can be using a repeater and there's lots of repeaters set up all over the country. That allows you to communicate over farther distances.

A directed net is a verbal protocol for people using a ham radio, where one person is in control of the net and they handle all traffic that goes on between the net and the net can cover a large area.

For example, where I got my license was in Marin County and they have a set of linked repeaters all throughout the county that's used for a lot of purposes, but also emergency coordination. If they operate a directed net on those linked repeaters, they can handle emergency communications all across Marin County.

Kevin Kelly: The way that they do that by the way, is that because this is what they call mesh network? Meaning that they're, except for the repeaters, but even the repeaters can be locally driven or powered, it's not going through a central hub like your cellphones are central towers.

It's being powered basically the power for it is in the devices themselves. If you have a bunch of people who are working on batteries or solar power you can have a network that's running even if the electrical network's down and the Internet's down. The ham radio network can still be up.

Laura Welcher: Exactly.

Kevin Kelly: That is the great advantage.

Laura Welcher: Yeah. When you join one of these informal groups they teach you about how to make sure you have access to battery power and I can operate for quite a long time on battery power. You know in an emergency often the cellphone networks go down ...

Kevin Kelly: Exactly.

Laura Welcher: ... And so that's a really important function. I was trying to think of what a good analog would be for it in the digital world. The Internet goes down, what's the alternative? I don't know. That's what this ...

Kevin Kelly: They don't have it. In fact, these mesh networks are now being done with cellphones. I think it's called fire camp app, which was used in the Hong Kong protesters, you can load an app onto your phone which can turn it into a mesh network where you are basically using your phone to directly communicate with another phone and not going through the cell towers.

Mark Frauenfelder: That's so cool.

Kevin Kelly: Right. This idea of the mesh network is really the only alternative that we have if the Internet or the electrical grid goes down. It's a fantastic backup system and it's people like you who are keeping it alive and activated until such an emergency.

Laura Welcher: Yeah. It's not just for emergency communications too. It's for fun. I guess I have a weird sense of fun. I do it also for event coordination like races, foot races. If you've ever run a race and you know they have those water stops every mile or so, usually there is a person with a ham radio there and they're participating in one of these nets.

I've also run in races with a ham radio and I've been able to report injuries. Like trail races, when you're in a remote environment and somebody gets hurt, it's really important to be able to relay to a nearby aid station what has happened.

Kevin Kelly: For a very long time you had to know Morse code to have a license. Is that still true?

Laura Welcher: No, you don't. A lot of people do still are very proficient in Morse code or CW, continuous wave. Many of my friends are very good at it. I'm not very good at it and I struggle to do five words per minute.

I'm fascinated in it because I think that's also one of those technologies that seems like it should be obsolete and it's not. It's actually very valuable because it's one of those signals that can be heard in even very noisy conditions.

Mark Frauenfelder: Yeah and with a [crosstalk 16:29] signal too, right?

Laura Welcher: Right.

Kevin Kelly: So, there seems to be a theme here. We got analog piano tuning, we've got this Morse code. You're interested in other things that are more analog like oil painting, right?

Laura Welcher: Yeah. I'm interested in analog generally. I'm not a good oil painter. I don't really understand oils very well, but I have all of my life just loved pastels.

Soft pastels are like chalk, like the blackboard chalk or the chalk that you use to write on the sidewalk when you're a kid, but there are very nice ones.

Of course, the ones that I can get now are much nicer than the ones I could afford when I was a kid. They are just buttery soft and you're laying down pure pigment. It's a wonderful, sensual experience and these colors are just so saturated. You can't really blend them like oils so you juxtapose colors to get these interesting effects. Anyways, I love them. I've enjoyed using them for a very long time.

This summer I took a class by a plein air painter. He works in oils as well as pastels. His name is Clark Mitchell. I took it nearby up Mendocino. He taught us techniques for working on location out of doors and it seems like that's another one of those obsolete-why-would-you-do-it kind of things because you certainly give up a lot in the way of creature comfort. You're out there for several hours at a time. You might be cold. Hopefully you're next to some sort of a bathroom. You have to plan your locations a bit strategically.

It's a challenge. The limitations are what can you bring with you and how can you carry it? How can you satisfy your creature comforts? How can you be out there, look at a scene and faithfully reproduce it in an artistic way in maybe two hours? Because by the time you start and finish within two hours, your light will be so different that you might as well start another painting.

I figured the reason for being on location is that you're doing something representational. You want to be able accurately portray the landscape in some way. Why the heck not take a picture? You know actually, when I'm out there I do usually take a picture at the beginning and the end so I know what the difference and the light changes were.

That sacrifices the artistic interpretation that you're doing, which I think is so beautiful. I think painting or even looking at a painting is a visceral experience you can see all of the brush strokes and when you're laying them down you have to think about those and plan those. It's a wonderful bodied experience.

Kevin Kelly: What is the tool that you're suggesting?

Laura Welcher: The tool that I'm suggesting, the one that I'm kind of infatuated with right now is this ... there's actually a set of cases by this company called Guerrilla Painter. It's a small family company. The one that I'm suggesting is called the French Resistance Pochade.

This company has this wonderful motto. It's for the Plein air painter traveling light, ready to paint at a moment's notice and under-the-radar painter. You're like a stealth, ready to jump into action, painters would carry one of these.

Kevin Kelly: What's the term that you use? Plein air painter?

Laura Welcher: Yeah. Plein air meaning you're on location, you're painting in the outdoors. If you think of the impressionists, Monet out there painting a gorgeous landscape, that's plein air painting. You have to deal with the sun and wind and the mosquitoes and heaven only knows what else, but you're out there making art in the outdoors.

Kevin Kelly: So, this is a case. It's like a wooden briefcase.

Laura Welcher: Yeah, it's a wooden briefcase. You have a lot of challenges when you're transporting your materials and of course, when you're coming back from being out in the field you don't want your stuff to spill, you don't want to ruin this painting that you've just made.

If you're doing oils or I suppose acrylic, your painting might still be wet. How do you not mess that up? How do you not get all over you? There's some tricks to it. The design of this box is really great.

I use it for pastels so I have dividers in it and I have a way to cushion the pastels so that they don't break. There's a way of carrying your canvases so that they don't get messed up.

Kevin Kelly: So you put the canvass that you're working on inside this thing.

Laura Welcher: Yeah. I should explain that it's a replacement for an easel so you need to have with it some kind of a tripod like you would use for a camera. You need the tripod and you just screw it on to the bottom of this box.

You open it up and all of your supplies are in there and then you set up your canvass in front of you and so you're standing up or sitting down and looking at the scene and you're able to paint upright.

Mark Frauenfelder: What's the brand of pastels that you use, Laura?

Laura Welcher: I have a variety of different types. There's Rembrandt's that are a little bit harder but the soft, super buttery ones are Sennelier. They are a French pastel. There's a lot of air inside them that has been formed when the pastel has dried and so it's very easy for them to crumble so you have to really protect them.

They're nice for those finishing effects because you can either do an underpainting or you can lay down the harder pastel. If you scrape one of the softer pastels over it, it just looks like shimmering light.

Mark Frauenfelder: That's good. Are they oil based or chalk based?

Laura Welcher: They are pigments so there's really no oil or anything in there. I'm not sure. There might be some kind of binder but basically, it's compacted dust, pigment dust.

Mark Frauenfelder: How do you spell that name? Sennelier?

Laura Welcher: Oh. S-E-N-N-E-L-I-E-R. I hope.

Mark Frauenfelder: Okay.

Kevin Kelly: Throw in a couple of extra vowels since it's French.

Mark Frauenfelder: Yeah, exactly.

Laura Welcher: Yeah. That's right.

Mark Frauenfelder: S-E-N-N-E-L-I-E-R. I found it. Okay, great.

Kevin Kelly: That seems like a pretty cool thing. It has a little tripod screw in the bottom and you open this up. [inaudible 23:32] on your tripod and now you have a little workshop with a bottom drawer where you put your paints or pastels or tools and then you have this thing flips up and it's placed to hold the canvass or the paper or whatever you're working on and then you can close the whole thing in and it's protected and you take the bus back.

Laura Welcher: Yes, that's right. You trace back to your car or your bus and off you go.

Kevin Kelly: Cool.

Mark Frauenfelder: That's great. You have one more tool to talk about. This one I've never heard anyone recommend this before, but it's one that I've used quite a bit.

Kevin Kelly: Oh yeah?

Mark Frauenfelder: I hired someone to use it for me.

Kevin Kelly: Oh, okay.

Mark Frauenfelder: Tell us about it, Laura.

Laura Welcher: That's an interesting scenario. I'm interested to hear how you did that. Maybe you don't want to talk about that.

Mark Frauenfelder: What I mean is that it's the notary seal. I've gone to places to get documents notarized all the time.

Laura Welcher: Right.

Mark Frauenfelder: You're a notary public?

Laura Welcher: I have been in the past. I'm not current right now, but I might do it again in the future. It's another one of those things that I just got super fascinated with and it seems like it should be obsolete like these other tools. It's definitely unplugged. There are notaries who will use electronic tools nowadays but you don't have to.

What it is I think at its core, as a notary public you're a public servant, you're working for the secretary of state. You have a commission. Your role is to, in part, be an impartial witness to a proceeding so that you don't have any interest in the document that you are notarizing or what it's being notarized for. You're there to be a witness and to identify the person who is signing this document. It's an in-person, face-to-face authentication system and it's intended to deter a fraud.

That aspect of it I think is totally cool. It's also ancient. It goes back to Roman times. Some notaries came out of the group of scribes. There are people who are practicing scribes and the role became more one of official witness or official transcriber of documents. It's been around for a very long time.

If you look at all of the authentication that you commonly engage in everyday, you have usernames and passwords, sometimes you have to prove on the computer that you're a human, but when it comes down to verifying that you are who you say you are, this is a very unplugged way to do that.

Maybe one day it's going to be replaced by on the stop DNA testing, if there's some big database of everybody's DNA, and there is some other biometric screening that goes along with it like you have to record your fingerprint but you do it on an ink pad, you stamp the journal with it.

That aspect of you have to show up in my office. I have to see you face-to-face and, in many cases, I have to watch you sign. You have to take an oath. As a linguist that's the part that I think I love the best because it's a way you do things with words when you take an oath.

You can lie to me from here 'til next Thursday and it doesn't really, for personal reason it might matter but not official reasons. As soon as you lie to me and sign your name and take an oath and I stamped it with my seal, that becomes perjury and that's subject to felony.

It's a very powerful act of how we do things with our words and in our actions and it has real-world effects but it also has this real-world authentication function that I think is just totally cool.

Kevin Kelly: You've taken that ancient system and you have a seal. Is the seal that you have particularly cool seal? Could you have something made out, carved from jade or can you do something special with that as well?

Laura Welcher: There are only certain companies that can make notary seals that are authorized to do that. I think a jade seal would be totally cool. The first time I got my commission I also got one of those desk seals which is an embossing tool.

I had never thought it worked very well. I couldn't see the impression as well as I had really hoped in my dreams that it would be because it's really gorgeous. It's an ink stamp that you use.

Mark Frauenfelder: Laura, when you were a licensed notary, were you allowed to notarize your own documents or would you have to go a notary if you wanted to do it?

Laura Welcher: No, you can't do yourself. In most cases, you don't want to do anybody who's a family member. You have to be impartial so in proceedings like with a partner or spouse it's hard to see how you would be impartial. For most things like that, myself and my husband would go to a notary and have somebody else do it. I mostly do it at work.

I'm there for convenience, but I wanted to do it just because I thought it was really neat. There are people who do it and they do it for a living. In fact, having somebody come to the house who's going to notarize something for me this weekend and you can make some money doing that. You can make a small business out of it, but for me it was always just ... I took it seriously but I was fascinated in it as a hobby procedure. I wanted to have an experience of doing that and understanding what it meant.

Mark Frauenfelder: There's something really cool about the hardbound journals or ledgers that they keep with the thumbprint and signatures. It seems like something out of another era.

Laura Welcher: It is, but those are official. If you're requested by the court you have to supply those. They're an official record and you have to keep those very carefully. There's a lot of procedures around them. For people who geek out over writing tools and documents and things like that, it's cool.

Kevin Kelly: What happens to the old ones? There have been notaries, as you're saying, for hundreds of years. Those ledgers, do they go somewhere official as people age?

Laura Welcher: You keep your records.

Kevin Kelly: Right, but when someone dies, [crosstalk 31:03] dies.

Laura Welcher: If somebody dies you have to make arrangements. If I get hit by a bus my husband would have to take my journal and my seals and take them to the secretary of state. That's part of that.

Kevin Kelly: Okay. The secretary of state is, in theory, collecting all these old ledger books?

Laura Welcher: Yeah. They should have them.

Mark Frauenfelder: They're warehoused somewhere.

Laura Welcher: Maybe.

Mark Frauenfelder: Along with the Arc of the Covenant.

Laura Welcher: The Arc of the Covenant. That's right.

Mark Frauenfelder: Well Laura, this has been really fascinating. Where can people go to find out more about you? Do you have a blog or a recommended tweeter feed or something?

Laura Welcher: I work for the Long Now Foundation. I have the Rosetta Project website, you can learn about our project there. There's lots of cool things going on at Long Now if you to LongNow.org.

I think a lot of the things I talked to you today are thematic with Long Now which is about long-term thinking. All of the tools I talked about are these tools that seem like they're in the past but yet they still have modern relevance.

You can go there and we have a lot of events. We have seminars about long-term thinking. We've got a new bar and café in the City of San

Francisco called the Interval. Come check that out. That's all on the LongNow.org website.

Mark Frauenfelder: That sounds great. Well, Laura, this has been a lot of fun. Thank you so much for sharing these fascinating tools we've never had a guest quite like you. These are unique and I really like them a lot.

Kevin Kelly: Yeah. This is sort of the revenge of the analog and the shock of the old.

Laura Welcher: That's right. Cool tools unplugged.

Kevin Kelly: Yes, exactly. Well, thank you.

Laura Welcher: Thanks. It's been tremendous fun.

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