

Bread

magazine



CONNECTING PEOPLE
THROUGH BREAD.

WELCOME

INTRODUCTION

Words: FRANÇOIS THIBEAULT and JARKKO LAINE

As we're writing this introduction, in Eastern Canada, winter and spring wheat crops have been harvested, cleaned, and stored. Farmers, millers, and bakers have started to test the new yield.

Some of these tests will be quite sophisticated—such as measuring the dough's strength and extensibility with the Chopin Alveograph, or the starch damage through evaluating the falling number—while other tests will merely consist of checking that there's no fungal activity in the grain.

Some bakers will prefer to let the flour speak for itself. They will spend hours making doughs and baking bread with their new batch of flour, becoming sensitive to—and observing—how the flour behaves under various conditions. The bread these bakers make will not come out of imposing an image of a perfect loaf but rather from listening to the grain and flour, and letting them rise up to their full potential, in spite of the challenges and difficulties.

For example, Gullimunn¹, a milling cooperative formed by Norwegian farmers, devised a flatbread to demonstrate that it is possible to work even with a falling number so low that most bakers and millers would consider the grain useless for human consumption.



Today, the communication around bread has become more and more global, with books, instructors, and even bread-making films on the web and social media going viral. At the same time, however, a thriving local scene is also emerging. Brian Lance's visit to the Asheville Bread Fair, which he writes about in this issue, corresponds to that emerging scene of bread gatherings that help shape a new bread-making culture. As a writer and a baker, Brian reflects on his family heritage and his rightful place in a world that's losing touch with real things.

1 <https://gullimunn.no>

Homebakers spread new tastes and forms of bread among their friends and families. Microbakers build new business opportunities in their communities by selling micro-scale productions of daily or weekly bread. Professional artisan bakers bring local ingredients, long fermentation, and flavor to a growing group of quality-conscious consumers.

James MacGuire takes us on a historical and peculiar journey in the world of French baking tradition, paying homage to Michelin-starred chef Charles Barrier and to bread professor Raymond Calvel. Calling bread "traditional" or "artisanal" only makes sense when coupled with the hard work and humility it takes to bake "good" bread.



When we look carefully, it becomes clear that grain, even more so than bread, is the most critical vehicle in connecting us to each of our local roots. The seeds that farmers sow and harvest are the symbols of the care they dedicate to the soil and to humans. As bakers, by supporting our local farmers, we can join them in that appreciation.

Captain Sourdough is a bakery in Eastern Canada that rises up to the challenge by running a small-scale business in the countryside. In the same spirit, Nikolay Apanasov is opening a bakehouse in Siberia, Russia, with a wood-fired oven, where he considers it his re-

sponsibility—on behalf of the community—to know the farmers who grow his grain.

In North-Eastern United States, Richard Roberts oversees the long-term development of sustainable farming businesses built around saving, restoring, and growing rare and heritage seeds. His dedication has led to the commercially-viable production of landrace wheat in the North-East, and to a stronger grain-based regional economy. And, as Jarkko saw this summer at the Nordic Heritage Cereal Conference, similar projects are being implemented throughout Europe.

As we decide to grow roots locally and to revitalize our communities through an agricultural approach and through bread, we're contributing to changing our shared world in a meaningful way.

Through the soil's life, and through the dough's natural fermentation—which Barbara Elisi Caracciolo discusses in depth in part two of her conversation with Ian Lowe—we're valuing the most essential elements we can gather from Earth and transforming them into something delicious and useful.

And doing that is fun!

So, let's not forget that, as we dig our hands in dough and share the fruits of our work with our communities.

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At the crossroads of home baking and professional artisanal baking, BREAD Magazine is an entertaining and inspiring journey that intends to foster meaning and deeper connections through bread.

BREAD is an independent magazine for bread lovers, made by bread lovers. It is a magazine for people who love and make great bread—for anyone who finds joy and fulfillment in the act of mixing a dough, the slow rhythm of natural fermentation, and listening to the crackling sound that comes from fresh loaves of bread as they cool in the quiet of the home kitchen or the bakery.

BREAD focuses on stories, biographies and narratives from the bakers, farmers, and millers’—and everyone else involved in bread—own perspective. It also puts into question popular beliefs and misconceived ideas by means of in-depth essays and technical discussions, in order to contribute to a higher awareness and knowledge of the issues that bread enthusiasts may encounter.



Cover photograph by **Jesse Cottingham**:
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After nine years in the US Navy, two years in academia, and working as a journalist, Brian Lance is now following in his grandfather's footsteps and baking bread.

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François Thibeault is co-editor of BREAD Magazine. He is engaged in baking bread, researching and writing about it, and sharing the vision of people who are committed to the grain-to-bread movement. He is seeking inspiration and empowerment in ideas, knowledge and experiences that can transform the world and the self.

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Nikolay Apanasov has been an avid explorer from an early age. He is currently in Akademgorodok, Russia exploring computer systems, bread, ecosystems and photography. When Nikolay is not actively exploring these subjects, he's likely on an adventure with his dog, a wondrous Rhodesian Ridgeback named Athena.

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Jarkko Laine is founder and co-editor of BREAD Magazine. He is a homebaker, writer, and software engineer from Vantaa, Finland, who never wants to lose his curiosity for the world around him.

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Barbara Elisi Caracciolo has a medical scientist's background, with a Ph.D. in medicine and double Master of Science in epidemiology and psychology in her backpack. Due to a deep interest in bread and health, she has founded Spigamadre, a health-conscious and eco-conscious mill and store that aims at making heirloom grain varieties more available and accessible to her community both near and far.

spigamadre.se
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REVIVING A BAKING HERITAGE AT THE ASHEVILLE BREAD FESTIVAL

BREAD TRAIL

Words: BRIAN LANCE — Photography: BRIAN LANCE and ISTOCKPHOTO

The route from eastern Virginia to Asheville, North Carolina, stretches through low, pine-slung land. It aims westward with little change in topography or civilization. Then come the mountains. Their foggy tops overlook Asheville, a bread oasis one might not expect just west of tobacco country. Yet, every year for the last thirteen years, a strong community of bakers and enthusiasts gathers in the Smoky Mountain Foothills to celebrate bread. In 2017, I joined them, seeking the inspiration to revive my family's baking heritage and mix it with dreams of bringing my own loaves to market.

The Asheville Bread Festival—like the Kneading Conference, the Grain Gathering, and WheatStalk—is one of what Peter Reinhart calls the “fantasy camps for serious bread-heads.” In an email to me, Reinhart wrote that these events “have served to provide a wonderful opportunity for serious home bakers to interact with professional ar-

tisan bakers and learn some of their techniques and also to become part of the bread baking community.”

Steve Bardwell and his wife, Gail Lunsford, own Wake Robin Farm Breads and started the festival with Reinhart’s help. The couple had earlier founded the Madison County Farmers’ Market only to discover a dearth of artisan bread in the area.

“Without Steve and Gail this would have been a one-off event,” Reinhart wrote, “and with the ongoing support of the local bakers and many volunteers, it endured and grew, very organically, into a destination event. It was a perfect storm, in a positive sense, of factors, probably also reinforced by the fact that Asheville is a pretty cool, innovative place where magic seems to happen around a lot of things, especially the arts.”

Since then, both the festival and the Asheville bread community have risen together. The festival has become a destination for professional and home bakers, bread

enthusiasts, and general epicureans alike. There, they converge to learn, talk, and eat all things bread. It draws more than 1,500 visitors and nearly 20 bakeries a year from around North Carolina, all of them crammed into a conference room at A-B Tech Community College's Asheville campus. In addition, the festival has hosted workshops run by renowned bakers, including Reinhart, as well as Jim Lahey and Lionel Vatinet.

More than any one loaf or workshop, however, it was Asheville's bread community that made the biggest impact on me. (Though, City Bakery's dark chocolate-cherry sourdough lasted only about an hour once I got it home.) In Asheville, bread enthusiasts have re-established the prominence of the neighborhood baker on a regional scale. The bakers foster artistic variation and greater choice for consumers, without going industrial. They've stuck closely to the artisanal spirit of the community-supported bakery model.

"Why do all these bakers thrive and co-exist?" Reinhart asked. "Only a theory, but, again, Asheville is that kind of place and, also, because most of the bakers started off small, not mega, so there was enough business to go around."

THE STAFF OF HERITAGE AND COMMUNITY

Asheville stirred up a distant memory about the central role bread plays in communities. My grandfather and his many brothers inherited a small Italian bakery from my great-grandfather, Vito Crocco. In the early 20th century, Vito came to the United States from Pontelandolfo, Italy, a tiny mountain hamlet situated directly between Naples and Apulia—the lands of pizza and bread. He first opened his doors as a neighborhood pizzeria in Waterbury, Connecticut, but he soon began baking bread. After WWII, my grandfather and his brothers expanded the Crocco Bros. Bakery beyond Waterbury, across Connecticut, and into Massachusetts and New York. All this thanks to a huge revolving hearth oven, mechanical dividers, and heated proofers.

Dozens of people from Waterbury worked there. My grandfather believed in engaging the local community, drawing employees from the city's racially and ethnically diverse population in a time when much of the country was still segregated. Crocco Bros. formed a close-knit band of bakers and drivers alike. My mother and father met there. Sure, the



Aerial view of downtown Asheville, NC.

“SOMETHING HAD BEEN MISSING FROM MY LIFE: GOOD BREAD. PERHAPS BAKING PROVIDED THE PERFECT BALANCE OF HAND-WORK AND HEAD-WORK I’D ALWAYS WANTED IN MY PROFESSIONAL LIFE.”

bakery had gone large-scale, nearly industrial. Nevertheless, it remained a community hub, and the bread remained central to my family's identity—a well-spring of bread lore.

Crocco Bros. Bakery closed in the mid-1980s, the victim of a family feud. Its demise left a hole in my family, and perhaps in Waterbury's bread community. Whenever I mention its name to locals of the previous generation, they remember it with the longing of good bread. Still, none of my grandfather's children, nor those of his brothers, picked up the staff of life. They all went on to other things. I was five when it closed. But for years after, I'd listen to stories about how the bakers would load the ovens with huge peels, find more efficient and effective mixing techniques, or use stale bread in new dough. I observed my grandfather's search for the best use of day-olds: croutons, bread crumbs, and soaked in milk and sugar as it was in his childhood. I had been steeped in this bread lore. However, I had also gone on to other things: college, the military, writing, teaching. Just about everything except for baking.

That changed for me when I received the book *Flour, Water, Salt, Yeast*, by Ken Forkish, as a gift in 2014. My hands sunk into that first batch of slack dough, connecting me

with not only the ingredients but my lost heritage as well. The mixing sparked images of how my great-grandfather might have done it a century earlier. Something had been missing from my life: good bread. Perhaps baking provided the perfect balance of hand-work and head-work I'd always wanted in my professional life.

In the years since, I've been training, making up for the time spent not baking. I've consumed volumes of bread books, those on its history as well as those on theory and craft. I've studied wheat and grains and milling and microbiology. And I've practiced, baking up to twelve loaves a week in my home oven, experimenting with methods and varieties, recording the results. What's more, my home has become the hub of a bread community—a distribution point for my obvious surplus of loaves, a place to sample new recipes at bread (or pizza) nights. All of this has happened in the spirit of togetherness that powers the countless micro and community-supported bakeries that have sprouted worldwide. Where my baking goes, its financial prospects, matters less than what it accomplishes in those gatherings. I'm in it for the look of someone who, for perhaps the first time, has tasted good bread.

The Asheville Bread Festival conjured all these musings of bread, community, and heritage. There, the festival-goers walked counter-clockwise circuits around the bakers' tables. They'd break off in bunches to sample a loaf or to chat with a baker. I circled the tables with them, submitting to the current, overwhelmed by the variety and quality of bread. Each loaf represented a successful formula, the result of science and art and their interplay with the history of human food—not to mention the result of sweat, sleepless nights, and cramped arms.

As Asheville's bread community circled the room, the full potential of bread in action emerged. Bread festivals draw us together to celebrate our bread-making practice. But without united people, without united communities, bread on a table is left to stale—if its dough gets mixed at all.

EPILOGUE

As I write this, it's 4 a.m., my family is still asleep, the house quiet except for the ticking of my oven preheating. Two whole wheat apple loaves proof in Pullman pans on the counter—lunchbox and toasting bread for the new week. My whole rye starter and liquid levain silently digest their last feeding beside the grain and seed mix soaking for tomorrow's porridge bread experiment. Those projects punctuate my daily life now, especially on my days off. Sweat and sleepless nights, indeed.

Nearly a year and a half have passed since my trip to Asheville. So much has changed. I was a writer and adjunct professor, scraping together a living that never quite justified all that college, and compiling "positive" rejections from New York publishing houses for the two novels I'd written. That lifestyle shucked me from the utopia I entered in graduate school. What started as discontent seethed inside me until November 2017 when I found myself in the Veterans Affairs mental health ward, having woken one morning unable to face my media studies students at Mercy College in New York. My depression, which I thought I'd beat after leaving military service, had gone clinical for the second time in my life. Silly me.

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Maybe I'm being too hard on my depression, however. After all, had it not derailed my old life, how could I have started this new one? For, amid all my existential wallowing, group therapy, and medicated adjustments; I quit teaching (and writing to some extent) and began my life as a stagiaire at the Bantam Bread Company in Bantam, Connecticut. I'd written about the bakery for a story in Connecticut Magazine earlier that year. The owner, Niles Golovin, is a member of the Bread Bakers Guild of America and a former New York City cook turned baker by staging at Richard Bourdon's Berkshire Mountain Bakery. At Bantam, they baked the bread I wanted to bake, and eat, so I had to work and learn there.

Golovin took me in—the stray I was—even though I had only my home baking experience. He proved a patient and trusting mentor, who let me work the bench from the first day alongside bakers Matt Kirschner and Raffi Morales (patient mentors, themselves). I staged there for six months before Golovin hired me, four of those while working in another (unmentionable and unsanitary) bakery to pay the bills. From the start, I felt included, integrated to the goings-on of the bakery. I belonged. At Bantam, I not only learned how to bake for production, I learned that I should have become a baker fifteen years ago. It would have spared me much career anguish. I finally struck the balance between head and hand work. I became one of those elder Millennials that give up the illusions of the white collar and paperwork and return to a more practical way of life, finding peace in an age-old trade.

Sure, the baker's life is a tough one. All that bending and lifting, the oven biting my forearms, the sleep deprivation keeping me in a mildly psychedelic state. But eight, nine, ten hours at the bench with a good crew (Bantam has one) and clear goals is better than one hour in a cubicle sneaking social media time on the computer instead of composing spreadsheets. Being challenged physically

and mentally helps subdue my depression. I come home tired, yet after my midday nap, I hit the bench in my kitchen to make bread for my friends and family.

My passion for bread remains tireless, like my grandfather's. He died in April, after 93 years, most of those lived in a bakery. He'd given me his baker's blessing before he went, saying in his raspy, toothless way that my ciabatta was too good for him to eat. "Take it to market," he said. For months before his death, he'd wake frantic in the night, trying to get to the bakery, his body in bed but his arms shaping loaves automatically. Muscle memories don't fade, I guess. On his deathbed, he went placid, his breathing calmed, and his hands went about that task—patting, rounding, rolling. A few hours later, he died. So, too, would have my family's baking heritage, if not for me, and with luck my two sons.

These days the snooze button rarely urges me in the wee hours as it might have in life before baking. When it does, I imagine my grandfather and his father as young men, rising in the predawn to bring the bread to life, and in that action, help sustain the life of their communities. I'll be a lucky man to follow them even half as far. ♣

A BAKING DAY WITH EDDY MYSLIWIEC

BAKER DIARY

Thursday - 6 a.m.

A late start for a baker, but I was up until 1am baking large, high hydration pan loaves. Thankfully, we are home-based so no need to commute! Doing two markets this summer has kept us plenty busy. Thursdays are especially crazy: there is production to finish for the day's market, plus getting ready for the following day. I check the ripeness of my levain then start mixing doughs for the dark chocolate bread and the focaccia, then get on with shaping the brioche buns and braids. As soon as that is done, I prepare my levain for the afternoon's breads and start the autolyse for tomorrow's multigrain.

8 a.m.

This summer, it appears many bakers around the world have experienced extreme temperatures and humidity. It's certainly been that way in Montreal. It usually means we're running around playing catch-up with crazy-fast fermentation. Today, conditions are finally back to normal. I can stick to my usual inoculation amounts and timing. I add the seed soaker to the multigrain then load up the first bake of the day: the kamut bâtards. Kamut is one of my favourite grains: It is delicious in both bread and pastry.

Eddy Mysliwiec is a sourdough baker and instructor. He is the owner of Breddy Boulangerie, a microbakery located in Montreal Quebec, Canada. He sells his naturally-leavened specialties at two local farmers' markets, including pains au levain, panettone, crackers and other products that showcase local organic flour. Follow him on Facebook and Instagram: [@breddyboulangerie](https://www.instagram.com/breddyboulangerie).



10 a.m.

It's time to bake the products that are best fresh: chocolate chip cookies made with freshly-milled whole wheat, financiers with almond and kamut flours, brioche and rye focaccia topped with seasonal vegetables...

Noon

Lunch time! We have little time to actually cook. So we take advantage of all the fresh produce we get at the markets and make big salads, eggs and toast. I always try to make time to sit down and eat. As we eat, the chocolate bread bakes and fills the kitchen with the rich scent of cocoa.

1.30 p.m.

It's time to go get the car from the local car-share station and get ready to drive to the market. Tara, my partner in life and business, is getting everything ready: putting bread away in bins, packaging a few last items, and we're off to battle the Montreal traffic.

3.30 p.m.

I get back home and immediately start mixing more dough for tomorrow: first the kamut, then the brioche, miso-sesame and millet-buckwheat. The afternoon consists of stretching and folding, watching the temperatures and development of gluten. I get occasional text messages from Tara who tells me what's moving and what's not.

7 p.m.

Quickly attending to a few fermenting batches of dough before heading off to pick Tara up: shaping the multigrain and miso-sesame, putting the millet-buckwheat in loaf pans, and giving one last stretch and fold to the kamut. We return home shortly after 8 p.m. I shape the kamut loaves and place them in bannetons. They will proof in the fridge overnight. Today's market went well. We nearly sold out. At the dinner table, Tara tells me about her day: friends who came by, what produce she picked up, feedback from customers...

As I can't be there in person, I relish her account. And knowing that people enjoyed our products brings me a great sense of satisfaction.

Past 12 a.m.

I struggle to not fall asleep as I watch over the day's last bake: 2-kilo pan loaves of miso-sesame country bread. These need more than an hour in the oven to produce a moist, gelatinized crumb with a thick dark crust. The epitome of a good loaf. It will be another short night, but I look forward to being at the market in the afternoon, seeing our regulars and talking about flour and bread with curious new customers. ♣



Portrait at the farmers' market.



CAPTAIN LEVAIN

BAKER PROFILE

Words and Photography: FRANÇOIS THIBEAULT

Captain Sourdough, that's Ghislain Despatie and Céline Richard's village bakery in Quebec, Canada. As engaged, weird—in creative ways—and open-minded bakers, they're walking on the footsteps of French farmer bakers. That is, they only make naturally leavened, organic sourdough bread. As farmers, they grow bread-quality grains, including Red Fife and einkorn. As millers, they mill their own flours, just in time for baking.

In the bakehouse, Ghislain's a metalhead and an opinionated bread activist. In the kitchen lab and in the shop, Céline's a creative foodie who's carrying her Breton roots into tasteful experiences through pastries and cakes. From their community-supported bakery, they're reinventing the ways from field to table. Captain Sourdough is fighting against ingrained habits and commonly received ideas about bread. Why? Because they stand for a balanced way of life, and they carry a high standard in bread.

Captain Sourdough embodies a farmer-baker philosophy that fosters and supports innovative and creative relationships between grain, flour, bread, and people. I met with Ghislain and Céline at their bakery, making bread with them while they shared their story.

A MINIMALIST APPROACH TO HAND KNEADING

I drove to Stanbridge at sunset, vineyards passing me by swiftly on both sides. Between earth and sky, twilight casted shadows on one of Quebec's most scenic and fertile wine regions. Now, earth was resting, and the baker's evening schedule was just beginning. There's just one crossroads from the main road leading into the small town of Stanbridge East—I almost missed it. A museum, a pub, the post office... Captain Sourdough's bakery appeared next to a countryside school converted into a house, Ghislain and Céline's home.



Céline weighs ingredients for the night's doughs for the cookies, pastries, and other sweets.

On that Monday evening, the duo was busy weighing and dispatching ingredients into several white tubs. By hand, Ghislain was mixing flour, water, salt, and wild sourdough.

"I mix rather than knead the dough, and I go very slowly, but powerfully. I don't want to hurt my shoulders and elbows, so I alternate between my left and right arm," Ghislain said.

"I don't fold the dough, because it's already late when I'm done mixing, and I want to get some sleep!"

He maintains three sourdough cultures: a rye, a white Kamut, and a buckwheat culture.

He mixes the next day's doughs in the evenings, so they can rise in bulk throughout the night, benefiting from the aroma, texture and volume of a long fermentation. Some doughs were just a few kilos, others weighed more than ten.

As a proof to his hard labor and commitment to hand-kneading, there were no mechanical mixer in his lab. Ghislain mixes the dough in a wooden trough and in plastic tubs. From the outset of the bakery's project, he wanted to do things in their essential ways.

"MY GOAL IS TO TAKE AS LITTLE TIME AS POSSIBLE WORKING ON THE DOUGHS, AND HAVE AS MUCH TIME AS POSSIBLE TO SPEND WITH MY KIDS AND MY WIFE. I DON'T WANT TO BE A PURIST AT ALL COSTS."

"When I'm mixing by hand, I have a better feeling of the dough, I have a better control, and I know directly how it develops," Ghislain said.

"I mix small doughs, a few kilos at a time, so it's manageable. My goal is to take as little time as possible working on the doughs, and have as much time as possible to spend with my kids and my wife. I don't want to be a purist at all costs. A lot of bakers are caught in their habits, and work only according to the tradition they've received.

I want to learn new techniques so that I can save some time. And I also want to make sourdough bread that I like. I have other passions in life too!"

An olive and garlic blossom baguette dough filled the bakehouse with a spicy and sharp aroma, and with a salty smoothness. That green color was very unusual for a dough.

Defying gluten, a 100% buckwheat pan loaf, with a buckwheat flour sourdough, consisted in a dough that's thicker than a pancake dough, but that's still impossible to hold by hand.

Ghislain finished mixing the doughs and setting up the next day's bake by 10 p.m. The tubs were left close to the floor's coolness,

covered with linen canvas. With no large fridge or walk-in, the dough's temperature needs to be monitored closely. In summer, Ghislain often uses icy water, to keep the dough's temperature close to 10°C (50°F). Humidity can also be a challenge, affecting the dough's hydration ratio, and how it ferments overnight.

"Ideally, my next pieces of equipment would include a cold room, or a controlled proofing system, in which I could put the doughs overnight, and they'd be ready the next morning," Ghislain said.

With a long bulk rise, eight-hour or more, the doughs develop deep flavors, and facilitate the baker's family lifestyle.

A FARMER BAKER'S JOURNEY

Ghislain and Céline's adventure into bread started with farmer baker mentors such as Nicolas Supiot, Pierre Tranchant, and Franck Perreault—all Brittany natives. Farmer bakers grow various organic wheat varieties (including the famous Rouge de Bordeaux), mill the grains, and make naturally leavened, sourdough bread with freshly milled flour.

Following the farmer-baker tradition, they knead, divide, and shape dough by hand, and bake it in wood-fired ovens.

Farmer bakers often promote “old-fashioned, naturally leavened organic sourdough bread baked in a wood-fired oven.” Some of them do not even have a shop from where they sell their breads. They journey to local farmers’ markets, take orders from faithful customers, deliver their breads, and enjoy working from their private bakehouse.

“We fell in love with Breton farmer bakers. At Nicolas Supiot’s place, we found a very spiritual dimension that connected water, flour, dough, and the oven,” Ghislain and Céline said.

That experience was part of an initiatory journey through which Ghislain and Céline discovered their passion for agriculture, food, and bread. “As Wwoofers, we were always ready to give a hand, and to work hard, even up to 10 hours a day when our host needed help. When our hosts shared their life with us, it helped us learn a lot, and that turned us into keen helpers,” they said.

“I’ve always been a savvy foodie,” Céline said. She has a strong preference for sweet treats such as brownies, Breton shortbreads, and cookies. “Can you believe I used to work in organ pipework in my previous life!” she laughed.

While meeting the challenges from the journey and experimenting the world, they started dreaming about building their own small-scale, microbakery.

Ghislain returned home and trained professionally in a bakery school. He was also an intern at Joe la Croûte, an artisanal bakery in Montreal founded by Daniel Jobin. He learned the commercial ways, and worked long nights. “I never want to work at night again!” Ghislain said.

Photos on this spread: Ghislain working at the bakery, shaping and baking bread.





“LIFE, ROUTINE, JOB ARE ALL MIXED UP FOR THESE ARTISANS WHO NO LONGER MAKE A DIFFERENCE BETWEEN THE SHOP AND HOME.”

CREATING A COMMUNITY-SUPPORTED MICROBAKERY

When they made plans to create their micro-bakery, Ghislain and Céline wanted to find an inexpensive house that'd be well-located in the countryside. They also wanted to live near enough to Montreal where they could sell their bread at farmers' markets. Living in the countryside would also allow them to make farming plans alongside their bakery project.

Ghislain and Céline found an old countryside school, which became their home as well as their bakery. Apart from the bakery's sign on the front lawn, there's no evidence of a bakery inside. The bakery's actually an extension behind the house, with a boutique at the front. The house's apartments are separated from the bakery only by a door that's usually left open—visitors and customers often peep in through, thus exposing the bakers' life to scrutiny. Life, routine, job are all mixed up for these artisans who no longer make a difference between the shop and home. Baking has become a lifestyle, it is not just mere work.

The current boutique once accommodated both the boutique and the shop all at once. With an investment inferior to that needed to buy a new car, they equipped the bakery with second-hand and new material, and renovated the old building.

Four to five times a week, they bake up to six oven loads per day. They make do with their old electric deck oven, and dream of building a wood-fired brick oven. Baking material is hard to find at a cheap price in Canada, and they had to import some of it from France, including the large, round plastic tubs they use for mixing and kneading.

The rustic and country-style atmosphere of the place is underlined by a large hardwood counter in the middle of the boutique. The fresh loaves welcome customers right when they pass through the door. Behind the counter, a large poster depicts a revolutionary holding a baguette, as a statement of Captain Sourdough's philosophy.

The liminal space between the bakery and the house is filled with kids' stuff, strollers, and clothing. The boundaries between the two spaces are blurred, as a testimony to their lifestyle.



Ghislain and Céline in front of their bakery-home.

BAKING BREAD WITH AN ATTITUDE

Ghislain's a serious metal music addict.

"I've tried to listen to other styles, but I just don't like them. So I keep on listening to metal even when I'm baking!" he said. His two kids have also developed their own taste for metal music.

"I'm this sort of bum and metalhead. I don't wear white t-shirts, only black ones. That's how I am, and I am transparent with my clients. I'm not hiding myself. When customers visit the bakery shop and I'm still working, there's often metal music blasting through the speakers," Ghislain said.

The next morning at 6:00 a.m., a pretty late hour by bakers' standards, Ghislain divides the doughs, and turns them into balls to let them rest a while. While turning on the electric oven, he's already planning the day's bakes. Today's just a few bakes, including one with more than 150 burger rolls that I'm helping Ghislain with.

Multrigrain, wheat and rye, pesto and garlic baguettes, buckwheat breads... we're falling into a rhythm dividing, making balls, shaping, and baking the first batches. The burger rolls required an extensive effort, shaping two at a time.

The last bake was done in the early afternoon, when Ghislain cleaned up the lab, and started planning the formulas for the evening's doughs.



RISING UP: FROM GRAIN TO LOAF

At the outstart of their baking journey, Ghislain and Céline chose to leverage ancient grains (including Red Fife) to differentiate themselves. On a one-acre land that they cultivate by hand, they've sown and harvested rye, einkorn, fall wheat, spelt, and emmer.

"Last year, we had to thresh the grain by hand. That took us most of all our weekends for a few weeks. Hopefully, we can start to grow more grain on a larger area, and rent the equipment from farmers," they said.

They don't own any land. They focus on seeds, reproducing and testing them. Transitioning from one acre to at least five would require enough seeds to make sure they get a good yield. Meanwhile, they're like nomadic farmers, and they create sustainable bonds with organic farmers in the area.

Ghislain's called himself "Captain Sourdough" because he's an engaged bread activist. He won't compromise over sourdough bread, so he's fighting for it. Only sourdough. He's challenging received ideas among bakers who believe that there must be even a small amount of commercial yeast to make the dough rise, and to get a loaf volume big enough to please customers.

French farmer bakers stand for the opposite. They believe in sourdough, and Ghislain's following in their footsteps—refusing to add even as little as 0.2% of yeast in the dough. He accepts to face the challenges and consequences.

Following their mentors and inspired by the Real Bread Campaign, Ghislain and Céline succeeded in creating and running a community-supported bakery.

"Our business plan was clear that we wanted to do things differently from other professional bakeries. From the beginning, we relied on a network of people and a community that believed in us. The model of community-supported agriculture was a great model for us, and that inspired us to do what we do," Ghislain and Céline said.

Ghislain added: "We deliver bread baskets that customers have already paid for, around here and in Montreal. We're also building relationships with community-supported farmers around here. Nobody believed in our creativity and our originality at the outset of the project. All the professional bakers that I know cautioned me that my business plan wouldn't work out, because I'm located in an isolated place in the countryside, because I am baking only small batches at a time, and because I do not own a shop that's open six to seven days a week."

"We remain pragmatic, and listen to our customers. We do make compromises on a few things, but never on sourdough! We want to keep this strong attitude. We will remain rustic in our ways, and in the manner in which we present our breads."

"All of our breads are sold on pre-order, customers pay us in advance. We only produce what we sell. We rarely have a surplus of bread. Sometimes, we don't even have enough for ourselves! We really don't want to be throwing bread away."



Through Captain Sourdough, I've found a commitment, an attitude, and a purpose that's not only driving Ghislain and Céline forward, it's also empowering a whole community. Customers, grain growers, farmers, and bakers join in together to create an ecosystem in which the flora of nature, that of bread, and that of life thrive in balance.

Focusing on the community happens to be the best way they've found to sustain a lifestyle that's consistent with their beliefs and their inspiration to make a difference. ♣



JAMES MCGUIRE

The Taste of Bread—Pioneering the Artisanal Bread Movement in North America from a French Perspective

INTERVIEW

Words: FRANÇOIS THIBEAULT — Photography: FRANÇOIS THIBEAULT and ISTOCKPHOTO

After training with French-bread specialist Raymond Calvel and with Michelin-starred chef Charles Barrier, James McGuire opened up Le Passe-Partout, one of the first artisanal bakeries in Montreal, in the early 1980s. As a technical editor for the translation of Raymond Calvel's opus, *Le goût du pain* (The Taste of Bread, Springer, 2001), he helped North American bakers get a better grasp of the long-standing French bread tradition. He mentored chefs and bakers who eventually opened up their own successful shops in Montreal and beyond. With hindsight, James McGuire looks at the early days of the artisanal bread movement in North America. He questions some of the trends that are now taken for granted and wonders, with a touch of nostalgia, how the taste of bread has fared in the 21st century.

JOURNEY FROM CHEF TO BAKER: BRINGING THE TRADITIONAL WAYS TO THE NEW WORLD

Bread Magazine: How did bread happen in your life?

James McGuire: I've spent the last forty years in Montreal, Canada. I began as a cook and pastry person. That was at the time when cooks were supposed to know something about other subjects besides just hanging at the stove. I ended up in a restaurant in Tours, in the Loire valley in France, where chef Charles Barrier [1916-2009] took all of the satellite preparations very seriously. Barrier, besides the usual cooking and pastry, smoked his own salmon, made his own charcuterie. He was basically afraid of nothing. A big difference was that he did them seriously.

While I was at Barrier's, he had a completely professional bread-making operation. He had a separate room, with a Llopis oven—a brick oven with a round rotating hearth

“IT WAS SUPPOSED TO BE A VACATION, BUT I REALLY COULDN’T GET OUT OF MY RESTAURANT’S KITCHEN. I KEPT ON LOOKING AT THE BREAD.”

that he could turn with a crank, as you put those loaves in and took those out. All of this to make bread for sixty people, before lunch, and another sixty people before dinner. He wasn't happy with the results, while I was there. One day, right before lunch, this old man showed up, carrying a school bag. He shook hands with everybody—because the French spend half their lives shaking hands! You shake hands as you arrive, you shake hands before you leave for lunch, you shake hands when you come back from lunch!

The guy with a school bag, he asked us a bunch of questions: "Show me the bread you made this morning! Show me the recipe! What kind of flour did you use? Show me the oven." He went out to the dining room and had lunch with the boss. He came back with a little piece of paper, about three inches square with a tiny handwriting on it, that said: "Add another 200 grams of water to the dough. Let the dough ferment for an extra fifteen minutes before you divide it and shape it." As a pastry guy and not a bread guy yet, I thought: "What difference could these small changes possibly make?" He shook hands with everybody one last time and left.

When the bakers made bread again, the difference was absolute. That was quite really something! The guy was Raymond Calvel, who for fifty or sixty years was probably the most important figure in bread-making in France.

I left Barrier and came back to Montreal. We remained very close. He was like a father to me. He took a consulting job at the Hotel Méridien, so he could have an excuse to come to Montreal. I would go back and see him. I'd take a holiday to visit him. I was chef-owner of Le Passe-Partout, which I had founded in 1981, I had a wife and a child, and it was difficult to manage.

It was supposed to be a vacation, but I really couldn't get out of my restaurant's kitchen. I kept on looking at the bread and saying to myself, "Well! If I'm busy with my restaurant, the last thing I should be thinking about is bread. It takes too much time, it requires specialized equipment. I should be thinking about more important things." I kept on thinking about bread.

After a trip to Tours, in 1983, I got off the plane in Montreal and bought unbleached white flour. I made a terrible loaf of bread! I kept at it. It took me a long time to find out what the differences were between Canadian flours and French flours, there are too many things to look into.

I went back to France in 1987 and saw Barrier, and also spent a day with Calvel in Paris. I visited a bakery of one of his students. I became more and more serious about bread. Calvel came to see us in Montreal in 1987. He came back in 1988 and would stop by in Montreal anytime he was on his way to the United States for a conference.

There was a nascent bread movement going on in Montreal in those years. Together, we taught a course in 1988 at the École hôtelière des Laurentides. There were probably twelve students, more than I would have thought, including a baker a semi-industrial bakery that had an interest.

I kept baking. When the lease ran out at our first restaurant location, we found another one that was large enough to add a bakery. The restaurant and the bakery were right next to one another. To get to the restaurant, you had to walk through the bakery. It was serious food. Most bakeries have little cafés, but we were serving serious food. I think le Passe-Partout became one of the best restaurants in Montreal at that time.

We would always give bread to our customers when we had some left at the end of the day. We were making more the next day anyway. We were making all the bread, all the charcuterie, smoked the salmon, and did a bunch of those things as well.

BM: How did the Passe-Partout evolved after Barrier's influence?

JM: Barrier was a huge influence. I followed completely in his steps! I didn't think about it that way then. Year and years later, Barrier came to stay with us for two weeks and he looked at me, seeming a bit bewildered: "You are running a very complicated place!" It was true. Too many things were going on! He did not have a bakery, he just made bread. He was not selling smoked salmon and all of

those things. It was less complex. We were very small. When things were going well, it was fine. I was the only one who could replace the baker, the croissant guy or the cooks. When somebody got sick, my days became twenty-two hours long.

I was still young enough. Somehow, it worked for a while until it eventually shut down. There was a divorce, which led to bankruptcy, which led to a big life change. Over the years, I had started gravitating more and more around bread. I was still thinking a lot about food, still catered once in a while. However, it was mostly about bread stuff. I was teaching at King Arthur Flour and went at the Kneading Conference twice—they're a bunch of hippies in the nicest way! I've been writing articles for the Bread Bakers Guild of America, and for a food quarterly magazine called The Art of Eating.

BM: How did you get involved in the baking exhibition and competition scene?

JM: The United States baking team that competed at the Europain show in Paris would practice in the laboratory of this yeast company called LeSaffre. LeSaffre has been so busy with bakers and baking teams in Asia—which has opened up this huge market—that LeSaffre no longer had room for the United States baking team.

I found them a place to practice, a flour mill called Viron, in France, known for the Retrodor baguette. We spent a week there. I wasn't a coach, I was kind of a facilitator. I

**"WE WOULD ALWAYS GIVE BREAD
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was translating, helping people find stuff.

In 2009, almost by default, I was a member of the Quebec team that went to La fête du pain, in Paris. It's a festival that they've been having for the past 20 years or so. The artisan bakers' association realized that more and more bakeries were closing, that people were eating less and less bread. Bread consumption in France is currently around 180 grams a day—in 1960, it was a 250 gram baguette. The association worried about finding employees. La fête du pain is held in a tent the size of a football field, on the parvis de l'église Notre-Dame. Every year, they invite a baker from somewhere in France. But in 2009, they invited a team from Quebec. I was part of that team. It's a ten-day event, so none of the young guys who have their own bakeries could get away for ten days. So the Quebec team leader ended up asking to people like me who were a little bit older and less busy.

ARTISANAL BREAD MOVEMENT

BM: How has media played a role in fostering an artisanal bread movement in North America?

JM: The media is a generational thing. Younger journalists like to hang out with younger bakers, with trend setters. The things about trends is that something *à la mode* will eventually be no longer *à la mode*, by definition. We go through these phases: I'm not sure we'll be talking much about sprouted grains in ten years.

In cooking and in bread-making, the food and the bread are supposed to be the stars of the show. Bakers are pretty humble guys, because they are willing to see things that way. Cooks tend to be show-off. Now we are seeing a few bakers who are show-offs as well. Good for business, maybe not the best thing for bread. Baking is a very humble profession and it's hard work.

In 2005, Jeffrey Hamelman and I went to visit the winner of the Best Baguette in Paris competition. A guy named Eric Sanna. We arrived at 12:05 on a Saturday—on Saturdays

bakeries shut down at 12:00. Madame Sanna saw us peering through the window. She opened up the door and gave us part of the bread that they had kept for themselves, realizing that we must be tourists and also bakers.

We met him after that at the Europain show. The bread was absolutely delicious. What I found even more impressive was that Eric Sanna, who was making 700 baguettes a day and other kinds of breads, was also finding time to help with the croissants. He did all those loaves of bread by himself. That's huge. From the bag of flour to pulling out the loaves from the oven.

Bread-baking is hard work. It's repetitive. It takes a special kind of patience. I think in France there is less pressure to invent, though that's begun to change—more and more bakers feel like artists. I think you can only take that so far. There's humility in taking simply flour, water, yeast and salt and making a completely delicious baguette without telling: "I have to reinvent this."

There is an axiom in English: "If it ain't broke, don't fix it." You can try to make it better. Everytime we make bread, or anytime we cook anything, or whatever, we should always be saying: "Is there something I can do to improve this?" But you don't necessarily have to reinvent the wheel every time you do that.

BM: What kind of bread culture do you see emerging out of this pressure to invent?

JM: The European mentality is catching up with the North American mindset. But if you can't make bread better... Calvel used to say that when bread has no flavor, bakers season it. It can become a competition because one guy puts olives in the bread, and the other guy says: "Well, I can put olives and I can put dried tomatoes." Then we get these long lists of things going into the loaves, which means that if you sit down in a restaurant, the bread basket is like Russian roulette. So many different kinds of bread that you don't know what you're getting. It does not necessarily



“IN COOKING AND IN BREAD-MAKING, THE FOOD AND THE BREAD ARE SUPPOSED TO BE THE STARS OF THE SHOW. BAKERS ARE PRETTY HUMBLE GUYS, BECAUSE THEY ARE WILLING TO SEE THINGS THAT WAY.



go well with the food. When in fact a baguette or something simple is like rice in oriental cooking. You don't get tired of the rice even though you are eating it everyday. With simple breads it's the same thing. With too many different things, you'll say: "I've had this thing too often." I don't think the solution is to keep on adding more things.

I can say that and have my opinion, because I'm no longer in the business. I think we made probably six different kinds of bread at Passe-Partout. There are a lot of bakeries around who are trying to make twenty-five. That's a lot. How can you pay attention to all of those things? I believe that simplicity does not rule out beauty.

BM: What are your views regarding the current trends in the artisanal bread movement, like whole grains?

JM: There are different ways to love bread. For some people, it's more of a philosophy. The actual loaf of bread almost becomes secondary. You've got different camps. I don't necessarily believe that white flour is a

poison, like some do. Jeff Yankellow makes croissant with whole wheat. If you make croissants with whole wheat, they can be ok but they'll be a little heavy and you won't get those delicate aromas, because you're getting the bitterness from the bran. If you are still putting that much butter in there, changing the flour to whole wheat instead of white isn't going to make it healthy!

Whole wheat is coming back. Once a woman came into my bakery and was saying: "I buy whole wheat because white flour is a poison." I saw her at the checkout counter and she had a package of white pasta. White flour in bread is a poison, but she can still have her white pasta.

That's an inconsistency that makes me wonder. My feelings about the subject is, yes, we need fiber. If you are eating healthy bread all week, there is no reason why you can't have a baguette or a croissant on the weekend. We tend to think that bread is supposed to provide all of our fiber, that it's supposed to be the healthiest thing we eat. Well, yes, in general. We should also be eating lentils and all kinds of other stuff.

“IF YOU ARE EATING HEALTHY BREAD ALL WEEK, THERE IS NO REASON WHY YOU CAN’T HAVE A BAGUETTE OR A CROISSANT ON THE WEEKEND.”

When you have a good balanced diet, there is room for a croissant or baguette too. Seeing things that way would make people more open to this healthy kind of eating, instead of being so strict that it makes it all sound almost scary.

ARTISANAL BREAD IS DEAD, LONG LIVE ARTISANAL BREAD!

BM: What about setting up standards for “real,” “good,” or “artisanal” bread? How would that help?

JM: OK, “artisanal” is gone! Once an industrial factory can call its bread “artisanal”—and that’s happening all over now—then that term is gone. It’s too late to protect it.

I once suggested that bakers in Quebec protect that term. My suggestion was that bakery owners could, as long as they’re respecting certain standards, have a way to certify that they operate a genuine artisanal bakery. But so many bakers work for bread companies that have huge factories while at the same time operate local bakeries. They’re wearing too many hats at the same time. On one street, the company owns an artisanal bakery where they make the bread. Then, there are other stores not too far away where you get that company’s breads which come from the factory.

It’s confusing for customers.

Calvel used to say, “No law could force a bad baker to make good bread.”

I think it’s a start if there are some rules for the *pain au levain de tradition*. But there is a mistake in the rules [that are in place in France], because the obligation is for a pH of 4.3 and below, and 900 parts per million of acetic acid. That makes loaves which are much too acid.

I once made some pain au levain in Paris, the pH was 4.4. Everything was alright, everything tasted fine, with a beautiful lactic flavor, and not just that acetic, vinegary stuff. But my loaf would have been illegal, or there is something wrong with the rule.

Hubert Chiron, Jeffrey and I had a wonderful pain au levain tasting one night, but some of these loaves had very little distinguishable levain flavor. We went to Hubert’s laboratory, and some of these loaves were in the high 5s in pH—so completely illegal, and nothing to do with levain in terms of flavor... I suppose it’s a good idea that some of these rules are in place. At least, it’s a start.

In the United States, there’s a similar law about pain au levain: you can only add 0.2% and less of fresh yeast. How can you catch these guys? Can you put yeast into levain? I suppose you can. Sugihara and Kline found that if you go above 0.2% in fresh yeast, the characteristics start to change. That does make a bit of sense. There was a time beginning in the 1870s where everyday bread was made with levain de pâte (prefermented yeast dough with salt), which was a deliberate hybrid between levain and yeast.

“CONSUMERS RARELY KNOW ABOUT HOW BREAD IS MADE. SO THEY RELY ON BAKERS TO FIGURE OUT WHAT THEY ARE BUYING.”

Consumers rarely know about how bread is made. So they rely on bakers to figure out what they are buying.

How do we know when good bread is available? Where do we look up to? A friend might tell you, you may read an article, but you have to go and try it yourself. Once again, Calvel said: “Nature abounds with all sorts of tastes, even with anomalies.” In France and in North America, baguettes are getting heavier. We’re kind of changing the definition of the baguette, which should be something relatively light and crispy. Bakers show off with how much water they can put in the dough. It’s the overpissuing contest! So the dough is so soft that you have problems baking it and making it crispy. Some guys are putting the loaves into 300°C (572°F) ovens, instead of 240°C and 250°C (464°F and 482°F), to try to get these loaves to lift off the bottom. That’s going a little far.

A Calvel-style baguette is not so over-mixed that it’s completely white on the inside. It’s got a nice yellow crumb, but it’s crispy. That’s what baguettes used to be, and are no more. We have no control over what bakers do. In terms of styles, that doesn’t bother me. I still have certain preferences. One of the problems with the baguettes is the use of badly maintained liquid levain. Liquid levain can turn so sour. The baguette still looks pretty good, it tastes pretty good, but just as you are swallowing it, the acid hits you right at the back of your mouth, and you go, “Ugh!”

That’s a badly maintained liquid levain.

Whether or not levain should be in a baguette, it’s all open to discussion. It’s perfectly legal. But baguettes were born with straight yeasted doughs. They showed up in France just after WWI, they started to appear on price lists around 1925. Voltaire did not walk around Paris with a baguette under his arm. It’s brand new, so are croissants.

THE FUTURE OF GRAIN, FLOUR, AND BREAD

BM: There are bakers who are connecting with farmers, sourcing grain, and milling the grain in the bakeries, kind of integrating the processes from field to loaf. What are your views on this evolution?

JM: Once again, we’re getting more into the area of philosophy. I think it’s a wonderful idea. Who could not rejoice with the fact that Quebec wheat is back. It’s wonderful news! But it does not have that much flavor. I don’t know whether it’s the varieties that they have to grow, because the growing season is a little shorter or what. Some people add roasted malt to try to boost what is otherwise a slightly bland flavor. Western Canadian flour has a little bit more flavor. You’re stuck: do I go for the better flavor, and as long as there are no additives or other bad things, or do I go for a local product because it’s a local product? It’s tough to say.

I also tend to think that milling is a separate trade, “Each to his or her own job!” There is more to know than pouring wheat through stones. If you want to make something natural, it’s pretty complicated.

At Viron, for their flour, they have to use about 200 different kinds of wheat. Every time it is delivered by truck, they take a sample and they analyze it. Above all, they use the Chopin alveograph. Just to make sure that they are getting the right curves, so that the performance of the flour and the baguette dough will work. Especially, in the fall, when the new harvest comes in, it's hell on earth!

They spend so much time worrying about getting just the right mixture, just the right proportions of these different wheats to be able to make a flour that is consistent enough, so that the bakers can make a reasonably constant and reliable baguette.

There is the idea that flour should be eaten fresh, that it should be the whole berries. You can run into loaves that are like that and that are delicious. It's a different way of seeing things which I have complete respect for. But I also don't mind something a little bit more traditional.

It depends on what grains we're talking about. Take rye for example. For technical reasons, and not just freshness, it might be a good idea to grind it yourself. That's for rye, and there are special problems with rye. Rye is very complicated. We've just scratched the surface, and too many people don't know the important aspects.

BM: What direction bakers should go regarding grain sourcing? Should they look up for flour that's been milled with a single source of grain?

JM: It's completely open to discussion. If you talk about white flour, and about making a baguette, you are usually looking for a bunch of different growers, different sources. Viron gets 200 varieties from a 30-km radius, so they are still talking about their own region. It's only when you can mix the different batches of grains that you can find a consistent product, if you really want a consistent product. Otherwise, you can say, "This is this year's wheat from this one guy." That's OK too, but there can be some very bad surprises. In France, there exists a Controlled Origin





Certification for a baguette du terroir, for this one bread. Why baguette? Maybe because it's a more commercial loaf.

I don't subscribe at all to the idea that heavier bread is somehow more genuine. Every flour has a potential. If you take a flour that could make a perfectly light and delicious baguette, and make heavy baguette with it, that makes me wonder. Flour should be like grapes to make wine. Winemakers take the grapes and in the winemaking process try to realize the potential of those grapes, and turn those grapes into the best wine you can.

Sourdough, whole wheat, freshly milled flour: there is always a large array of options to navigate through...

Which is as it should be. That's probably the future of artisanal baking. I was once in an industrial bakery in Toronto, and they let me use the flours that I often used at that time. They let me make a batch of dough and let me put it through their industrial system where the dough goes in one end and comes

out the other end, and it's basically untouched by human hands. All the shaping and all of that stuff, and the results were terrific—which is scary! We have invented machinery that is so gentle with the dough that it's like hands. It can make the same very delicate doughs and come up with extremely good results. I fear that eventually factories here will understand and be able to produce those loaves. When that happens and when they are sold parbake, so they can be finished in convection ovens in supermarkets, then it's going to be hard for artisans. Because those loaves could eventually be very good, and some artisans might be hard pressed to make something as good. So maybe it is better to diversify. It's already the case with croissants: I know a factory that's making better industrial croissants than nine out of ten artisans.

BM: What would be your advice to a budding, want-to-be craft, artisanal commercial baker? How would you advise this baker to make bread "as it should be"?

JM: Learn how to bake. Read books, like those written by Jeffrey Hamelman and Richard Miscovitch. I would try to spend some time in a bakery. I did all my best to pull all the information, read and read and read, but there was a time when I was with Calvel and saw the texture of the dough, really learned how to shape. That changed everything.

There is only so much you can get out of books. If you're working by yourself, then it's like playing music by yourself. You can get into bad habits and you'll play bad music. It's the same thing with bread.

BM: Finally, how are bread eaters and consumers more bread-aware today? How has their taste of bread evolved?

JM: We can all have our own impressions and we should. If we want to make pronouncements, we have to know a little more about what goes on.

That's the problem with Twitter where people are reviewing restaurants. People can dislike something for the wrong reasons. Someone can say, "I don't like this pain au levain because it tastes acid." Well if it's too acid, that's fine. If there is some acidity there—and there should be acidity there—if you don't like it, eat something else! ¶

"THERE IS ONLY SO MUCH YOU CAN GET OUT OF BOOKS. IF YOU'RE WORKING BY YOURSELF, THEN IT'S LIKE PLAYING MUSIC BY YOURSELF. YOU CAN GET INTO BAD HABITS AND YOU'LL PLAY BAD MUSIC. IT'S THE SAME THING WITH BREAD."



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We are proud to work with partners who share our goal of connecting people through bread and whose messages contribute to our mission.

Dear BREAD Magazine friends around the world,
For more than 40 years, I have been a strong proponent of whole-grain
bread, always insisting that this is the best way to enjoy nature's fine grain.

And for many, many years, I felt isolated in my thinking and practice.

No longer!

Today, there is a booming interest in an "escape" from using only refined flours for bread, pastries, pizza, and pasta. People are starting to realize that there is not just one variety of wheat, and that wheat is not all there is: rye and barley are becoming available in astounding varieties, as well as flours of other foods, such as millet and buckwheat.

We of the Mockmill team are very proud to be a part of this movement.

In over 60 countries, our Mockmill 100 and Mockmill 200 tabletop stone mills are creating daily joy in bakeries and kitchens, at mills and on farms:

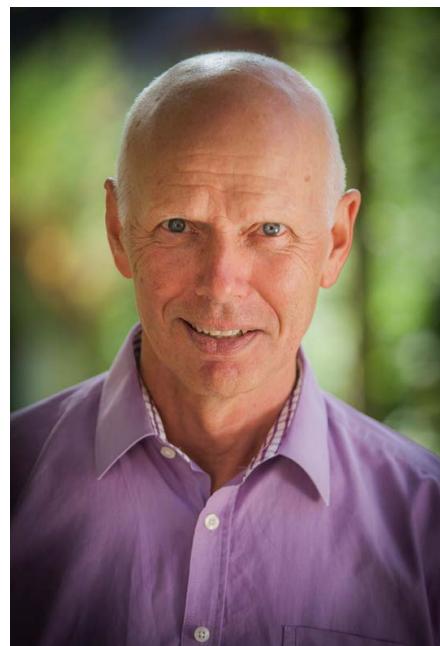
- Various types of grains, grown in smaller quantities can be offered to consumers just as they are, harvested and cleaned for milling, and milled in smaller batches.
- Bakers, pastry chefs, chefs, and pizza bakers are seeing their creativity fired by their ability to mill what they choose, when they choose, into the fine flour or coarse meal they need, exactly as they'd like to have it.
- EVERYONE for whom these Mockmilled foods are being made gets to appreciate the astounding taste and healthy goodness of freshly milled whole-grain flours.

I'm convinced that this movement will continue to advance, very fast.

I see it in the fascinated look on experienced bakers' faces when they first see grains transformed into fine, luscious flour, right on their countertops. I see it again when they close their eyes and savor, for the first time, the incredible, natural taste of real whole-grain bread and pasta, of polenta from freshly milled corn. And I greatly appreciate the many messages of thanks I receive for making that possible.

If you haven't yet experienced the excitement and pleasure of being able to create your own flours on the spot, don't delay! I have created Mockmill 100 and Mockmill 200 especially for you. Absolute top quality. Unequaled robustness. Finest milling outcome. And made for economic construction so that every baker, pastry chef, and cook can afford one. I hope you'll decide to become a Mockmiller today!

Your,
Wolfgang Mock,
Master Mill Maker
www.wolfgangmock.com





THE BEST BREAD BEGINS WITH A HEALTHY SOIL.

Some of the most delicious loaves of bread are made with just a few ingredients—flour, water, salt—and great care for the end product. In the same way, I believe farming is best done by keeping things fresh and simple, with the least processing and using a high-quality cereal.

Birkkala Farm in Suomusjärvi, Finland has been around since 1872, and growing spelt for over twenty years. My wife and I continue building on that tradition as we create organic products using original spelt varieties such as Oberkulmer Rotkorn, Schwabenkorn, and Bauländer Spelz, all grown on our family fields.

We see the soil as our foremost customer. With the help of crop rotation and by taking great care of the soil, every fall, we get to harvest a delicious and nutritious crop—with a yield that doesn't pale in comparison to the ones from regular growers—without the need for fertilizers or pesticides. The long Finnish summer nights when the sun almost never sets give the grain a distinct flavor and help the plants' roots extract even more nutrition from the ground.

Finally, before shipping the products to you, we stone-mill our grain, adding nothing, just the way you (and we) like it. This is how we continue to nurture the family heritage to one day pass it to future generations, even healthier than it was when we took over.

Simo Larmo
Farmer and miller,
Birkkala Farm
www.birkkala.com

We ship worldwide!







PRACTICALLY ORGANIC

A Russian Baker's Quest for Organic Grain

FEATURE

Words and Photography: NIKOLAY APANASOV

Wendell Berry said that the act of eating is an agricultural act. Well, the act of baking is certainly an agricultural act, and a profound one at that. A baker is a person that makes agricultural decisions for an entire community—a bridge between the dinner table and the farm. As such, we bakers are in a unique position to educate and inform and to drive awareness and activism in our communities. If we begin to value self-reliance and resilience, and understand that the regeneration of our lives, our society, and our ecosystem is not the responsibility of someone else, but our own, positive change can begin through seemingly uneventful steps, at the very place we find ourselves.

Right now I'm located in a suburb of Novosibirsk, Russia called Akademgorodok. I'm in the process of opening a wood-fired sourdough bakehouse called *3bread*¹.

As strange as it may sound, I didn't plan on building a wood-fired oven in Siberia. It kind of just happened. With abundant, local, organically-grown grain and an impressively stable economic and political system, my previous home in Washington state would have been an ideal place for the venture. But after a thought experiment, the seed of the idea to open a bakehouse here emerged in my mind.

While visiting family in Novosibirsk, I had two polar impressions of Russia. First, I helped my grandfather, Юрий Андрейевич Шиллер, film a documentary (*Дорога в Деревню* --- Road to the Village) about village life in Siberia. These villages definitely have their idiosyncrasies, but I fell in love with them on a visceral level. I was swooned and

¹ 3Bread bakehouse website coming soon: <http://3bread.com>

danced along to their natural rhythms. I simply felt at home. The people we met were human: beings that are convivial, hospitable, gentle and open-hearted. Yet I should not have been so astonished. Russians, and Slavs in general, are a gentle, communal people. Community is indispensable for surviving the winter. So centuries old traditions, preserved and regenerated through village life, have been the vehicle that has passed on, amongst other things, the skills necessary for survival: interdependence and cooperation.

But unfortunately the filming ended, and the road that led us to the villages led us back to the city.

After living in the village all summer, our return to Novosibirsk felt less like a day trip and more like interstellar travel. The environment perfectly illustrates what happens when the industrial system of globalization emerges within a developing country. Many people are struggling to survive, working from night to night, driven to a frenzy. The city is filthy, constantly blocked in traffic, and like the weather, most of the people are antagonistic, cold and unsympathetic. I was ready to leave and go find Moksha somewhere else. But I settled into my discomfort for a moment, and instead of changing the venue, I asked myself a question: what can I do to make life enjoyable here and now?

I realized that the heart of my discontent was a feeling of isolation and separation, a complete void of community and connection. And an essential part of what I have always cherished about bread is its ability to connect and unify people. Everyone understands good food. There's nothing to disagree about, simply good vibes to share. Though Novosibirsk is for the most part an insipid and dreary place, you can still find wondrous humans here, especially in Akademgorodok.

One thought led to another, and I realized that opening a bakehouse would be a compelling experiment. A bakehouse naturally becomes a center of community, an attractor for like-minded people. So I decided to adapt

to my environment by building such a hub; a traditional Russian oven was erected in Akademgorodok, and a real adventure began.

I would say that like the village, bread is at the heart of what is called Russia. At the heart of most homes in the village is a wood-fired oven. Many people can recollect how their grandmother would bake them bread in such an oven. There are many traditions tied to bread baking, and from talking to people, I have been amazed by how many people know of these traditions. Traditions such as baking at night, baking in silence, continuing a starter, and so on—esoteric knowledge by many accounts—is known by many a taxi driver. It's because Russian history and culture is intimately intertwined with bread. A proverb here says that bread is the 'head of everything.' Children are even taught to pick-up, kiss and eat a piece of bread if it falls on the floor. So it is astonishing that bread is exceptionally difficult to find here. What is sold in stores as 'bread' is twisted and vile, a depravity for people that value honest bread. I walked around the entire city of Novosibirsk, looked in many a nook and cranny, and nowhere did I find bread. Good flour and grain are also difficult to find. A dedicated home baker can bake decent bread at home, if they know the couple (literally) of small stores where decent flour is available. But if you want to bake incredible bread in Akademgorodok, you are at a loss, because premium, organic grain and flour can't be found. A seeker of Bread is compelled to buy grain or flour from a couple of farms in the West of Russia, or the EU and other countries. Amongst many drawbacks, this is simply unsustainable. Driven by necessity, and likewise by curiosity, I decided to find out why here in the land of bread, quality grain and flour is nowhere to be found.

This a report about my exploration into organic farming. Having read books such as The Omnivore's Dilemma, The Organic Grain Grower and Permaculture One, I had a small well of knowledge on the topic, but it was

“TRADITIONS SUCH AS BAKING AT NIGHT, BAKING IN SILENCE, CONTINUING A STARTER, AND SO ON—ESOTERIC KNOWLEDGE BY MANY ACCOUNTS—IS KNOWN BY MANY A TAXI DRIVER.”



substantially fragmented, and exclusively intellectual, definitely not grounded in direct experience. But the natural world fascinates me, and I am a keen observer of it. I've spent many months backpacking mountains, forests, deserts, and everything in between. The topic of conscious human involvement in ecological systems with dynamic feedback loops, systems in which man participates symbiotically, is a particular interest of mine. And whether you realize it or not, at its core, baking is the act of creating, working with and adapting organic ecological systems to our human needs. This can be repeated verbatim for farming. Because of this commonality, I think we bakers are uniquely positioned to learn about the farms that provide us with grain. And because we are in direct contact with the community, we have a valuable opportunity to share what we learn, to educate the community about the farms that provide their food.

PERMACULTURE: A KNOWLEDGE BASED APPROACH

What I have learned about permaculture is that it is all at once a simpler, smarter, more practical and more sustainable approach to farming. It approaches the activity of farming through the lens of observation, analysis and critical thinking. It's a characteristically human endeavour. Permaculture is based on understanding the environment, land, soil, plants and animals as a complex ecological system that can be skillfully harnessed to

“SADLY, MOST FARMERS TODAY APPROACH THEIR WORK FROM A TYPICAL MODERN IDEOLOGY; THEY VIEW THE NATURAL WORLD AS CHAOTIC, AND TRY TO BRING IT UNDER ORDER AND CONTROL.”

achieve our needs—one small link in an inter-dependent global chain of ecological systems. By understanding the organic processes that exist within the system, the farmer can then work with the system's natural potential. Permaculture is centered around creating sustainable, regenerative, diverse and resilient ecosystems where perennials such as nut trees create a foundation for systems where every element is multi-functional, where energy and resources are utilized to a maximum degree, and where external inputs are minimized, if not eliminated. I will use permaculture as a term that designates the end of the spectrum, the ideal sought by organic farmers. I will use the term organic to describe a smarter approach to land use that genuinely aims to work with natural systems.

The spirit of organic farming is excellently described in a book called *The Lean Farm* by Ben Hartmann:

“A farmer’s work is more like that of a horse trainer than a mechanic, more like that of a healer than a computer repair person. It is not really accurate to say that farmers grow food or raise animals. Farmers alter environmental conditions in such a way as to maximize a plant’s or an animal’s innate ability to do its own growing—in the same way that the best horse trainers seek to draw out abilities already within their horses or in the way the best healers know when to stand back and let their patients’ bodies do the work. There is mystery in farming.”

Sadly, most farmers today approach their work from a typical modern ideology; they view the natural world as chaotic, and try to bring it under order and control, in order to achieve utility and security. They work against the natural system. This short-sighted, reductionistic way of farming is rooted in ignorance, ignorance of who and how we are, and what and how the world is. As Ben Hartmann writes, *“Carbon-heavy, production-at-all-costs agriculture produces greenhouse gases at an alarming rate; it turns fertile ground into wastelands; and it pollutes the water and air we all rely on. It is ultimately self-defeating...It is a style of farming that cannot endure because it misinterprets the work of farming.”*

These methods are expensive and they inherently impose dependence on the industrial system: a farmer must continually purchase external inputs (fertilizers, herbicides, insecticides and fungicides) and specialized seed developed to withstand this onslaught of synthetic inputs from a handful of transnational corporations. These methods are also more time and labor intensive than the simple, knowledge-based approach of permaculture. And looked at from the long-term, this way of working the land is prone to instability. It's unsustainable. Like machines, and like much of what is created by modern man, this method is a system that breaks down as a result of entropy.

In his book, *The Resilient Farm and Homestead*, Ben Falk summarizes this divergence eloquently:

"Biological energy harvesting and storage is what has allowed us to survive to this point, and our experiments of replacing biological systems with mechanical and chemical systems have at best been delayed catastrophes. We must rely on some non-biological aspects... but wherever we do we compromise the system and our own returns in the long term. The minute a barn is built, it begins to decay. The famous comparison of a tractor with a draft horse highlights the entropy principle at work here: A tractor and horse are comparable in the amount of work they can achieve on a small piece of land, yet after a time the tractor dies and the horse makes another horse. Only life processes are regenerative."

ANATOLI'S ORGANIC FARM

In all of the 17,125,200 sq. km that is Russia, I have found² one farm that has established a sustainable, consistent and viable organic farming operation approaching permaculture. The farm is owned by *Anatoli Ivanovich Shugurov*. It is located in Mokshan, a village about 40 km west of the city of Penza. The farm focuses on wheat and rye production, and just this past year, they started milling their own flour. For people in the know, and willing to buy in bulk, this is a wonderful source of grain and flour. I have been purchasing grain from Anatoli for just about a year now. I found out about the farm when a talented baker and blogger in Moscow, Sergei Kirillov, wrote about him on his blog³.

2 It is quite possible that there are other organic farms. The lack of a system of governmental regulation for organic in Russia, as found in the US, EU and other places, makes finding such farmers difficult, even in an information age. Anecdotally, I have heard that there are a number of small farms that practice 'organic' agriculture, but from what I heard, they sell to brokers that don't differentiate organic produce. Hopefully, this article will motivate any such farmers to get in touch!

3 "Замыкай круг", <https://registr.livejournal.com/97505.html>

Though Anatoli's farm employs a wide array of methods centered around working with natural systems, it is based around annual crops and can't be described as a permaculture system. And as it now stands, the farm will always be dependent upon oil as an external input. But using oil is an understandable temporary compromise in my book: even most experts on permaculture use oil derivatives as an input in the early establishment phases of their systems. We live in an age of cheap energy, and people such as Ben Falk argue that it would be foolish and impractical to not make use of this resource to establish regenerative, sustainable, and self-reliant systems that then go on to outlive the age of peak oil. Time and labour are limited resources and the idea is to work smart. Permaculture is rooted in idealism, but it is an idealism that is founded upon the values of practicality and critical thinking. And so I would describe Anatoli's farm as an enlightened industrial-organic farm, a Russian equivalent to Earthbound Organics, a farm Michael Pollan described in his book *The Omnivore's Dilemma*. I think that such farms are creating an immensely positive social impact, and though there are many compromises, it is an understandable step towards a future where most agriculture is rooted in permaculture.

Since I decided to open a bakehouse, I resolved that it was imperative for me to know my farmer. I consider it my responsibility, on behalf of the community, to be knowledgeable about the source of our food. But responsibility is not what drove me to the farm. Intuitively, I knew that if I established a genuine connection with Anatoli and his farm, the bread I baked would improve. And in all honesty, it is simply fulfilling, joyful, and wondrous to be connected to the soil that grows our bread. For me, this joy is the joy of a simple life, the basic goodness of life itself, which is mysterious and ineffable.

In September of 2017, at harvest time, I had the honor of visiting Anatoli's farm in Mokshan. Prior to my trip, I had read articles from Russian sources about Anatoli and his



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farming methods⁴. I found out that Anatoli manages a substantial farm; the focus is on wheat and rye production, totalling around 7000 hectares of land, and the farm was converted to organic in 1983.

I also knew that Anatoli is well educated; in each article I read, he seemed to be at home in the world of academic agronomy, often citing several famous Russian academics in the field. Yet, even from a distance, I could tell that this was a man grounded in practicality. Definitely not one of your idealist, back-to-the-earth type of farmers. Although he presented himself as a person passionate about sharing his knowledge and spreading sustainable, wholesome farming methods, all the conversations that I had read always returned to the simple questions: how does this or that method affect the soil, and thus, grain quality, yield and profit? I sensed that this would likely be an auspicious encounter; people that integrate theory and practice are the exception rather than the rule, but those that do are usually paragons in their fields.

After flying to Moscow and taking an overnight train to Penza, I met Anatoli at his farm, in Mokshan on an early Tuesday morning. To begin our acquaintance, in typical Russian fashion, I was treated to a delicious, farm-fresh meal in the farm office. He was generally quiet and laconic in speech. Small

talk was not on the menu. But Anatoli is anything but closed and unsociable. Though he is very large in stature, his manner is gentle, graceful, and generous. And his lack of small talk was contrasted by precise and substantive answers to questions about farming.

KEEPING IT SIMPLE AND PRACTICAL

The essence of Anatoli’s farm can be boiled down to one word: practicality. Shugurov employs the methods that are most effective at achieving yields that are abundant and profitable. Likewise, he values the simplest, cheapest, and least labor intensive methods of farming. That sounds like something every farmer should value, right? And while the goals of yield and profit are often cited as the motivators of a reductionistic, industrial approach to farming, they can in fact be applied in a much different light. This is similar to the question of ethics; most people consider a selfish approach to moral questions unethical. But Spinoza proved that enlightened self-interest produces moral values that equal, and even surpass, those espoused by religious teachings. If the goal of abundance and profitability is viewed from a long-term perspective, then the modern, chemical-centric process is a losing proposition. As I learned, producing abundant and profitable yields year after year necessitates a different approach.

⁴ “Непаханое поле”, http://poselenie.ucoz.ru/publ/nepakhanoe_pole/2-1-0-268



An often cited opposition to organic farming revolves around the time-cost of converting the land over to the new system. This necessarily depends on the initial conditions of the soil, but nonetheless, various sources on permaculture demonstrate that when knowledgeable techniques are applied, the efforts can prove to be fruitful much faster than most expect. This is confirmed by Anatoli's story. At an age of 67, Shugurov has been the presiding director of his farm for 35 years. When he became the director in 1982, the farm was in shambles. Wheat production was at 0.7-1 ton/hectare. It was the least productive farm in the entire province. At a loss of what to do, Anatoli searched for answers.

Anatoli was fortunate to hear about the work of two agronomists, Maltsev and Ovsinsky, at just the right time. Maltsev was a then contemporary agronomist whose work was on the fringe of Soviet academia. Then, as of now, the work of most agronomists revolved around an industrial farming methodology. But Maltsev asserted that farmers should not battle nature but rather learn from it and work with it. He came to the conclusion that

ploughing destroys the soil. Ovsinsky, writing at the turn of the century, went further. His work focused on regenerating and sustaining healthy soil, harnessing the natural potential of healthy soil for the farmer's benefit. Along with ploughing, he rejected the use of all synthetic inputs. And his framework substantially decreases labor inputs; it's a smarter and simpler way of farming. As Anatoli explained to me, his farming methods are for the most part based on the work of Ovsinsky, whose methods he began employing in 1983.

That same year, their farm yielded 1.5 ton per hectare. The next year, their yields surpassed the national average. In about five years, the yields increased further to 2-2.5 ton per hectare.

Today, Anatoli's farm grows mostly wheat and rye: a winter wheat, 'Безенчукская – 380,' a spring wheat, 'Тулайковская – 10,' and a rye variety named 'Саратовская - 7.' A small portion of the land is committed to barley, oats, clover, and various grasses; these crops are produced for market, but are mostly grown as animal feed for the farm's cows

and sheep. On average, the farm yields 3 to 4 tonnes of cereal grain per hectare. Just compare these yields to Soviet times when farmers were awarded the medal of 'hero of socialist labour' for achieving 2.2 ton/hectare. Anatoli's approach is the most practical and economical method of farming, even within an industrial market system without a market for organic produce. His success can be viewed from a profit standpoint: the farm averages a 300% profit margin. It is normally among the top 5 or 10 most profitable farms in the country, despite the fact that although grown organically, Anatoli sells his cereals for regular market prices.

The central interest for Anatoli is soil health: a healthy and productive farm requires healthy and productive soil. And healthy and productive soil requires a healthy ecological system around the soil. It requires the farmer to nurture the soil by skillfully attending to its environment, amongst other things, building and sustaining a sufficient layer of humus. Shugurov's approach is to mimic what occurs in nature. For one, the soil is never ploughed. Instead, farmers gently loosen the first few centimeters of soil using specialized tractor attachments (several times throughout the year using a number of different techniques.) The logic behind not ploughing is simple enough: plants receive

essential sustenance from the top soil, which ploughing inverts and destroys.

Healthy topsoil contains humus, a nutrient-rich substrate that is created when organic matter is decayed by aerobic microorganisms. Humus, which is very water retentive, sustains and nurtures plant growth, providing vital nutrients, along with microorganisms that provide functional benefits such as nitrogen through the process of nitrogen fixation. This process is illustrated by a simple example: bury a wooden post a meter into the ground and allow enough time for decay to occur. The decay occurs precisely along the topsoil depth, no deeper than 10 cm. This is because this layer is oxygen abundant, and the organic decay is perpetuated by aerobic microorganisms. Decay doesn't happen at a lower depth, because there, microorganisms are anaerobic. The plough directly subverts this essential organic process by inverting the soil, depriving aerobic microorganisms of oxygen, and conversely, saturating anaerobic microorganisms in it. The result is the destruction of these essential organisms, and with them, the healthy topsoil laden with humus, which sustains and regenerates plant life. According to Anatoli, ploughing causes another not so obvious destructive result: the plough substantially presses and compacts the soil below.

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Plants such as wheat and rye don't have the capacity to penetrate this layer, so ploughing essentially creates a barrier for root development. On a ploughed farm, this is especially evident in dry years. In wet seasons, the plants are adequately hydrated, but when a dry season comes around, the plants can't find water, and their health, and likewise their yields, suffer immensely.

To build nitrogen content in the soil and to help develop humus, the farm employs cover crops such as clover. To further build soil health, at the time of harvest, the farm leaves the crops' stubble along with mulch from the stalk in the ground. This mimics nature: you don't see too many ploughs making their way through the forests of the Taiga. No, instead organic matter settles on the ground and decomposes. This increases moisture retention, prevents deep-freezing of the soil in the winter, and prevents erosion in the spring.





On Anatoli's farm, the fields go through a rotation of winter varieties, then onto spring varieties, and then a rest; about 1/3 of the fields are resting at any given time. According to traditional agronomy, annual crops such as wheat degrade the soil over time even when employing crop rotation. Shugurov vehemently disagrees.

He maintains that as a result of not ploughing and leaving the stubble, roots and mulch on the top soil, a more abundant crop results in richer soil the next year. Soil analyses from his farm support Anatoli's argument; they have shown that on average, every hectare contains around 40 kg phosphorous, 100 kg nitrogen and 150 kg of calcium. I had my hands in the soil several times, and though I'm no agronomist, I could tell that what I had in my hands was exceptionally healthy soil: dark, rich and moist, almost buttery I would say.

Being new to agronomy and organic farming, I was curious about how avoiding the use of pesticides and herbicides affected the crops. From Anatoli's anecdotal evidence, healthy soil produces healthy plants, and these plants are much less susceptible to pests and disease.

“HE MAINTAINS THAT AS A RESULT OF NOT PLOUGHING AND LEAVING THE STUBBLE, ROOTS AND MULCH ON THE TOP SOIL, A MORE ABUNDANT CROP RESULTS IN RICHER SOIL THE NEXT YEAR. SOIL ANALYSES FROM HIS FARM SUPPORT ANATOLI’S ARGUMENT.”



Shugurov says that the farm loses a minute part of the crop to pests every year, but the damage is within acceptable norms. It can be seen as a natural regulation of the crop that allows the weaker plants and genes to die off. There have been a couple of years that were exceptions, where the farm suffered a considerable loss. But from a profit perspective, these can be seen as acceptable losses in the long run. And that's the way Anatoli sees it. Their farm doesn't engage in pest control; they focus on soil health and allow nature to do most of the work.

Anatoli's approach to seed, from selection to sowing, is also at odds with mainstream practices. Most agronomists contend that after purchasing seed from a seed bank, a farmer can go through three generations of harvesting a cereal grain and reusing the seed for sowing. They claim that grain quality deteriorates, and that it is necessary to repurchase seed. Yet the grain that I saw during my visit is long past the third generation. Anatoli never purchases new grain from seed banks, and according to metrics from analyses, his grain continually surpasses the original.

When it comes to sowing, the standard large-scale approach is that of a grain drill, which densely sows the cereal grain in even rows. But Anatoli says that this method results in the new plants fighting one another for root development, killing or weakening one another in the process. His machinery sows the seeds in a way that mirrors the result of hand broadcasting. Less densely packed, each seed has more space for sustenance, light, and growth.

CREATE, NURTURE, AND GROW

Anatoli's combination of consistent success and unorthodox methods has attracted many visitors to Mokshan. There have been thousands of people, coming from near and far, from Belarus to Irkutsk and everywhere in between. I was greeted with immense and genuine hospitality. Late one day, while visiting the field, I was welcomed into a round-circle meal among the workers. It was obvious that this generosity was a regular part of the rhythm on the farm.

Anatoli is genuinely interested and enthusiastic about educating his guests. Shugurov usually has copies of Ovsinsky's book, and he shares it with anyone that is curious. When I asked him about the application of these methods on other farms, Anatoli told me that a vast number of people have stopped ploughing and moved over to a surface working of the soil, but few have stopped using synthetic inputs. It seems that in Russia, the momentum is just not here yet. The simple approach seems too simple for most people.

As is written in the Tao Te Ching⁵:

*When a superior man hears of the Tao,
he immediately begins to embody it.
When an average man hears of the Tao,
he half believes it, half doubts it.
When a foolish man hears of the Tao,
he laughs out loud.
If he didn't laugh,
it wouldn't be the Tao.*

There are better approaches to farming than the ones my farmers employ. But for the time being, purchasing from these farmers is the best I can do. If I weren't willing to compromise, I wouldn't be able to open a bakehouse. But there are many decisions I make as a baker, and for the most part, even in this desert of Siberia, there is no need to compromise. I get to bake whole-grain bread, made from flour from my stone mill, in a two-day process using wild sourdough cultures. And I choose to purchase grain from farmers that I

⁵ Stephen Mitchel's translation

personally know, farmers that are aware of the vital importance of soil health and act accordingly.

Although the bakehouse is but a small cluster of energy, I think it's capable of moving my environment towards the sustainable, regenerative ideal that I envision. The plan is to entice people by baking astounding bread, bread that will stun a person into the present, bread that will drive a person to ask questions. I want to teach people that baking is a wondrous act of working with complex ecological systems that are composed of a physical substrate (water, flour, and salt) and living organisms (yeast and bacteria), showing them how bread is really the mysterious method we humans devised to eat grass! I want to educate the community about different kinds of wheat that can be used to build these ecological systems and the various methods of growing them. I am convinced that the establishment of sustainable, regenerative farms will lead to healthy ecological systems and healthy soil, which in turn will lead to healthy produce.

Healthy produce will allow us to cook and eat wholesome food, which is the foundation for growing and nurturing wholesome people. Since this entire process is centered in a different mode of being, in an attentive, conscious and critical approach to life and the world around us, this process is the way to a healthy society.

What if we direct our attention, and thereby, our energy, towards creative activities? We can all bake bread! We can plant gardens. We can learn about permaculture. We can learn about wheat and other grains, and mill our own flour. We can visit local farms and begin dialogues about ancient grains and permaculture. We can build CSA's that value organic food and farming. We can work towards the purchase of our own small tracts of land and develop that land into a permaculture system, becoming regenerative, resilient and self-reliant ourselves. We can create, nurture, and grow, rather than oppose, criticize, and destroy. As a wise man once said, give evil

nothing to oppose and it will disappear by itself. Maybe there is a simpler, more organic, approach to the question of organic. As we know, humans are selfish creatures. It would seem reasonable that given time, knowledge, and connections many farmers will begin to employ these superior methods on their farms.

Maybe it's actually quite auspicious that there isn't an organic market in Russia. Here, organic isn't a trend driven by idealism. It's a way of life driven by the value of practicality. Go to any Russian village, and you will see people composting. You will see every last object being reused, and many other forms of 'green' living. But none of it is green. Most of these people have never read the works of Sir Albert Howard or Bill Mollison, or any other visionary that influences the green movement. This is simply a way of life that has existed here for generations and continues to exist today. It is a way of life driven by reason and necessity. And what I have discovered, what has truly brought me joy, is the knowledge that enlightened practicality, that is, enlightened self-interest, results in a way of life that is harmonious with nature. Like all forms of life on this earth, humans constantly evolve, driven by the need to adapt. Our innermost nature is practical. So I will play instigator and argue that for this very reason, organic in Russia is even more organic than what's generally seen in the West. It's before, and beyond, organic. ♣

FURTHER READING

- Michael Pollan. *The Omnivore's Dilemma*.
- Bill Mollison. *Permaculture One*.
- Bill Mollison. *Permaculture: A Designer's Manual*.
- Ben Falk. *The Resilient Farm and Homestead*.
- Jack Lazor. *The Organic Grain Grower*.
- Eliot Coleman. *The New Organic Grower*.
- Ben Hartman. *The Lean Farm*.





RICHARD ROBERTS

Building a Regional Grain Economy From The Soil Up

FEATURE

Words: FRANÇOIS THIBEAULT — Photography: JESSE COTTINGHAM

Richard Roberts is a gardener, a seed saver, and the executive director of the Maine Grain Alliance's Rare and Heritage Seed Restoration Project. Bread Magazine joined him at his "farm," a little house down in the village of Solon, Maine, which he and his wife bought in 1976. From spring to Thanksgiving, they live off-grid, they garden, and most importantly, they marvel at the wonders of seeds turning into plants and grains. An experimentalist, Richard likes to take risks. On two and a half acres of soil, he dedicates himself to reviving ancient and heritage seeds that can feed people and support sustainable agriculture both locally and globally. He has an intense fascination and a childlike appreciation of the natural world that permeates his engagement with seed preservation and grain growing.

Bread Magazine: Bread bakers think of their main ingredients mostly in terms of flour, water, salt, and yeast, but rarely in terms of grains. What journey brought you to bread and grains, and what's your main focus as a grower?

Richard Roberts: I moved to Maine in my twenties, in the 1970s, as part of the back-to-the-land movement. Since then, I've lived off-the-grid and had big gardens. In the past, I've been an automobile mechanic, I've worked at a summer theater, and through that, I got involved in the local school district. I went back to college and got my teaching certificate—and ended up teaching high-school English for over 20 years.

When I was getting ready to retire, I thought: "Oh! That would be great, let me do something with this field at the front of my house." That's around the same time that the gristmills, called Maine Grains, was just getting started in Skowhegan.

“WHAT FASCINATED ME WAS GROWING GRAIN HERE IN MAINE, SO I REALLY GOT INVOLVED WITH GRAIN THROUGH THE GRISTMILL.”

I volunteered down there to help paint the inside. I grew some of my own grain then, an acre of oats and an acre of wheat. I took it there and had it milled. That was before they were so busy. Now they can't do custom milling anymore. I volunteered down there to help paint the inside. I grew some of my own grain then, an acre of oats and an acre of wheat. I took it there and had it milled. That was before they were so busy. Now they can't do custom milling anymore.

I've always been a home gardener but I'd never really been involved in grain. I made loaves of bread, but nothing special. What fascinated me was growing grain here in Maine, so I really got involved with grain through the gristmill.

I've only received an ounce of einkorn grains, and I'm just doing trials right now and see what will grow. I planted some einkorn last fall. It came up and looked really good, and then I had only about 50 percent survival rate over the winter. I'm trying to grow a part of it as a spring grain, to see if it will grow both ways. I'm also currently growing emmer, einkorn, Danish spring wheat, and Scottish barley, among many other varieties.

Now, the whole discussion about bread has led us to rethink what grain is about. The Maine Grain Alliance (MGA)¹, a not-for-profit here in Skowhegan, Maine, started about 14 years ago, primarily with people who were interested in baking bread. They got together and talked about bread.

The very first Kneading Conference was merely just bread bakers. In the early 2000s, the available varieties of grain were very limited. If you'd look into seed catalogs, there might only be one variety of winter wheat and one variety of spring wheat that you could grow. People wanted to try different things, but often it wasn't available. There were people who were growing these different varieties, but we needed to coordinate that whole effort.

Let me tell you the story of Jim Amaral, at Bo-real Bread, who was one of the early bakers in Maine to source his grain for his own flour. In the 1990s, he was just buying flour from regular sources.

Matt Williams and Sarah Flewelling, her daughter, from Aurora Mills & Farm, decided that they would try to grow some grain for him. Matt and Sarah knew something about grain, but all the knowledge from growing grain and the equipment to harvest it and to mill it at a smaller scale had gone away. Their grain all went to the commodity market. It was part of the potato rotation. You grew grain, and you might harvest it or not. If you did harvest it, you didn't care about the quality so much, because it was just going to go for animal feed. Matt had to relearn all of this knowledge that had been lost. Aurora Farm didn't even have a mill. After harvesting the grain, they were driving the grain to a mill in Brunswick. Then Jim would drive down on the Southern Coast of Maine to pick it up. He

1 <http://kneadingconference.com>

Not to be confused with the gristmill, Maine Grains (<https://www.maine.grains.com>)



said that by the time he would drive to the mill, he could have driven to New York City and bought some flour there.

Aurora Mills & Farm now has a flour mill, and the partnership with Borealis Bread has been going on for 20 years. It's taken that long to bring local grain growing and milling back again. We had just lost that knowledge and that infrastructure.

In 2013, we realized that we needed to learn more about the grain itself, and what varieties of grain we could grow here in Maine's climate. The MGA started the Rare and Heritage Seed Restoration Project. We managed to get funded with a little grant. I was one of the initial growers. We all started out by getting paid stipends to grow these small quantities of grain—just a handful, or maybe just an ounce of different varieties. We had four growers doing it. So when someone had a crop failure, at least we wouldn't lose the seeds.





Over the years, I've been able to find people who would volunteer to let me grow some grain on garden space they had. As these different varieties have grown out, and we got larger quantities, then I've been able to find someone who might have an acre that they could grow grain on. I would give them, say, a hundred pounds of a variety of grain. They would grow it. I would get back 300 pounds, and they could do whatever they wanted to do with the rest. It's working now. We have volunteer growers, and we have larger-scale farmers that get a percentage of the grain that they grow.

BM: History is such that Maine and New England were the bread basket for the American colonies. What are these historical roots and the current issues of grain growing and seed preservation in Maine?

RR: The New England bread basket all died off with the completion of the Erie Canal in the 1820s and 1830s. That canal went up the Hudson all the way out to Buffalo, New York. That land out there, which is all grape wines, was kind of America's best lands. That rolling, flat landscape, they grew a huge amount of wheat out there. It was through transportation cost that it put New England and Maine out of business as the suppliers. Since they could now ship the grains and the flours

right down the Erie Canal, to New York City, to the big markets. The state of Maine gave a subsidy to farmers in the 1930s to encourage them to continue to grow grain. But even with the subsidy, it wasn't enough: they couldn't compete with the transportation cost. Grain became for animal feed. They no longer had to worry about quality, or storing the grain.

I remember going to a grain conference in Burlington, Vermont, last year. There are a number of grain growers in the Champlain Valley who said that they had been growing grain for 10 or 15 years and were just about to give up on it—because of cost—when this whole local food concept came out. That's really what saved a lot of that. I think that it's going to drive the market here in the future. People want food that they're consuming, they want to know where it came from, and they want to try to have it as local as possible. Right now, with the gristmill that exists in Linneus, in Northern Maine, the Aurora Mill and Farm, and the gristmill that's in Skowhegan, Maine Grains, because that market exists, now farmers are willing to grow it when they wouldn't before.

I've heard a farmer say: "If you could give us a contract; if you could guarantee us that you will buy it, we would grow it." But farmers don't want to speculate on growing some

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“IF YOU’RE JUST A HOME-BACKYARD SEED-SAVER, YOU’RE LIMITED TO THE AMOUNT OF SPACE ON WHICH YOU COULD GROW THINGS ON.”

grain, and then hoping someone will buy it from it. Especially when they want it to be organic. So they would have to switch over from chemical farming to old, original organic agriculture.

Drying and storage are always going to be a problem. Because these mills aren't large enough here in Maine that they don't have facilities to store the grain themselves. So the farmer has to be able to store it and then when the mill is ready for 5 or 10 tons, they can ship it down there at a time.

It's keeping the grain dry, and storing it. That's the issue now.

The MGA conducted a study on that issue, in Augusta County. Now we're trying to get the funding to set up a few local storage facilities or centers up there. In the Northwest, there are these co-ops, with huge silos in the town, and the farmer would just take the grain in there, and the co-op would buy it from him and store it. These things just don't exist in Maine.

BM: How is the Rare and Heritage Seed Restoration Project changing how we perceive and grow grain?

RR: Since there were just a couple of varieties of wheat that we knew that we could grow here, we'd talk to seed savers, who would say: "Well, I've been growing this little variety of wheat in my own personal garden, for years. It works here!" So we ended up finding about five varieties of wheat. They were all winter wheat, to be planted in the fall. We found varieties of rye and emmer. People had

been growing very small amounts. The idea was to try to see what we could grow in Maine's climate. These were all varieties that people brought from Northern and Eastern Europe, including Germany, France, Denmark, and Ukraine.

The variety that seems to be doing best of all—it's called *Sirvinta*, after the Sirvinta river in Lithuania—originally came from to Maine from Estonia in 1988. Apparently, it's a widespread kind: someone bought it at a regular seed store there, and brought a small package of it over to Will Bonsall, a seed saver in Maine and the founder of the Scatter-seed Project. He's been growing *Sirvinta* here since then, and it has done very well. That's 30 years!

If you're just a home-backyard seed-saver, you're limited to the amount of space on which you could grow things on. By getting the seeds into the hands of the restoration project at MGA, you can overcome those limitations: our growing network includes people who are willing to take some of the seeds and grow them on a quarter of an acre or an acre. We're always looking for people who have prepared soil. MGA was given an acre of land just at the town limits of Skowhegan where we grow a bunch of varieties. This year we had buckwheat growing on it. Our goal is to have just enough grain out there that it can become commercially available for people. We've just been giving the grain away, and have not been making any money out of it.



BM: Seed preservation and reproduction involve a lot of scientific data and research. How do farmers and volunteers get access to support and information that can benefit them?

RR: Ellen Mallory is a professor of sustainable agriculture at the School of Food and Agriculture at the University of Maine, and she's one of the board members of the MGA. She's our source of scientific information. The University of Maine doesn't have any long-term projects going. They may grow a whole bunch variety of spring wheat and see how they do. They're interested in finding which ones might grow well here. In one of the projects, they were infecting the wheat with fusarium, to see what varieties would survive. Projects like this one might go one for a year or two, and then they'll go on to another project. I'm always referring people to the university website where they can find bulletin about grain-growing, all based on research, that we don't do.

At MGA, we can have these long-range projects that develop through an informal network of growers and people who want to contribute to the whole project.

This year, the Kneading Conference is going to be at Kennebec Valley Community College (KVCC), which is part of the state university program. They have a sustainable agriculture program and a culinary arts program. Two years ago, I got involved with the farm manager at KVCC, and we grew an acre of that Sirvinta wheat there. I came down with a seed drill that MGA bought for this program. It's a portable, six-row seed drill. It can fit in a back of a pick-up truck. We used a small combine to harvest wheat. We harvested the grain with the help of students at KVCC, and then we cleaned it and dried it. That grain that was harvested is now used in their culinary arts program.

“THE MAIN QUESTION IS: ‘IF WE GET A SEED FROM A DIFFERENT PLACE, AND WE GROW IT, HOW ARE WE GOING TO MAKE IT AS PRODUCTIVE AS POSSIBLE?’”

BM: The climate in the Northeast is quite different—more humid—than that in the Midwest, where most of the North-American wheat comes from. What are the specificities of the heritage wheat varieties you’re looking for, and how do you face the challenges of growing them?

RR: Here, there are diseases of grain that are prone to grow in that kind of damp climate. We’re always looking for seeds that come from climates similar to ours, which has been mostly around Northern Europe and the Scandinavian states.

Amber Lambke, at Maine Grains, was saying that for her gristmill, she used the equivalent of 1000 acres of grain last year. If you are an organic farmer, and you’re on a 3-year rotation, that means that for there to be a 1000 acres growing, there have to be 3000 acres of organic land in production. If you’re on a 4-year cycle, there have to be 4000 acres. Between 3000 and 4000 acres of land need to be in cultivation, organically, to provide that 1000 acres per year of grain.

Some of these “heritage” varieties don’t produce as much as some of the hybridized varieties. I’m not calling these varieties “heirloom,” because they’re not these old grains

that grew 100 years ago. Nobody really knows what these varieties were. We call them “heritage” seeds, and that’s only because they’re from a different location that has a similar climate to that in the Northeast. A lot of people believe that these varieties are these ancients kinds that have different characteristics. They do have different characteristics, not because they’re ancient, but because they’re sourced from a different place.

The main question is: “If we get a seed from a different place, and we grow it, how are we going to make it as productive as possible?” We might get a variety that grows very well, but that doesn’t produce very much grain. Then that’s not going to be as good as something that gives a lot of grain—because farmers want to get as much grain out of their fields.

On the small-scale land that I have here, I’m always looking for different varieties, and just try to grow them out. You almost have to get to a certain level so you can start seeing how much you’re going to get out of an acre. I have to say: “I don’t know the largest quantity, we’ve only grown half an acre.” It takes many years for you to get enough seed to be able to grow quantities so that you can even tell if in the long-run it’s going to be worth it.





That's one of the things that we can do with our sources in comparison to what universities can do as more established institutions. They just can't do that. We can do it by always looking for farmers who are willing to try and plant an acre or five acres of something and see how it goes.

Farmers are risk takers and experimenters. It comes naturally to them. If they've got some space, a lot of them will go: "Ah! Well! I'll take a hundred pounds of that and see what I can do. I can stick that in somewhere."

People get in touch with me, I collect their email addresses, get them in the group, and then tell them what sources to go to to find information, to get their fields back into pro-

ductivity. We don't have tractors and plows to work the fields out.

It's costly to convert nonproductive hay fields back into production, between \$500 to \$700 per acre. It takes time. You need equipment to plow and fertilize it. Maybe you'll need to put that will enrich the soil, and it'll probably take lime to get it going again. That's a young person's operation. It has to be someone who has years to think about, to get land back to farming again. MGA gives out technical assistance and mini-grants to young farmers. MGA is a not-for-profit, and people give us money with the expectation that we are going to provide these assistance grants. We can do it in just a week or two

“WE HAVE TO LOOK AT THE WHOLE COMPLEX CHAIN OF PROCESSES, DOWN FROM THE SOIL TO THE WORK OF THE FARMER, TO THE WORK OF THE MILLER AND THAT OF THE BAKER.”

weeks time: call for donations and hand out a \$5000 grant at the end of the month. There is not this long grant application process that keeps people waiting and waiting. Grantees could be a grower, a baker, anybody that has anything to do with grain.

So, we have to look at the whole complex chain of processes, down from the soil to the work of the farmer, to the work of the miller and that of the baker. If we want to understand all these issues and what is at stake with bread, on the culinary side or on the health aspects, we have to open up the dialogue so that we stop having siloed conversations where we might say, “This is what the farmer does, it starts here and stops there. Here’s what the miller does, starts here and stops there. Here’s what the baker does, starts here and stops there.” How is a more holistic or global perspective evolving right now from the viewpoint of bread-making?

One of the things that bakers can start doing is to verify how fresh grain is. That’s very important. There are local gristmills that people are coming to, where the grain is organic. Bakers have come to us and ask us if they can grow their own wheat. We’ve been working on that on a very small scale. Some bakers will grow grain in their backyard, and I encourage this idea—but it’s not always practical. You need space to grow grain.

In the whole network of the MGA, one of our goals is educational: We have people growing grain, and they tell others about what’s growing and how it does in the field.

Other people write about baking techniques. It’s like what happens at the Kneading Conference. Growers are there, brewers are there, bakers, oven builders, millers, etc. There exist small systems where farmers grow and mill the grain, and bakers make bread with the flour. Some of these bakers out there have tight relationships with the farmers who grow the grain for him. That’s an ideal situation, a baker who has an intimate relationship with the grower and the miller.

A lot of bakers are starting to realize that there is this concept of “terroir.” The soil itself does enhance a flavor to the different grains. I’ve given some of this Sirvinta wheat to bakers, and they were very happy with the flavor. Some large-scale mills might sometimes laugh at me, and say that it’s the baker that makes the flavor.

How terroir plays a role in flavor is one of the things we’re really looking into right now. Dusty Dowse, a retired university professor who’s the head baker at MGA, is really looking into this whole idea of gluten, what it does, and whether grain itself is healthy. There are a lot of people who are saying that we should move away from grain because they say it’s not that healthy. Dusty, as a scientist, is trying to gather as much data as he can about gluten and about health issues with grain itself. He’s also concerned with these weed killers that seem to be showing up in flours. Is that a real issue or not? Should we be concerned?

At MGA, we're trying to grow out many varieties so people themselves can try to use different kinds of grain and see how that affects them. Home bakers should remember that freshness is essential. How long that flour has been sitting somewhere. I think that this is really important to how well the baking experience happens, and the kinds of flavors you'll be getting.

Ultimately, what really matters to me is just the marvelous experience of planting something, seeing it come up out of the ground, being able to mill it, and turning it into a loaf of bread. It's all parts of it, from the earth to the hearth.

Let me conclude with a poem by the English poet William Wordsworth (1770-1850):

My Heart Leaps Up When I Behold

*My heart leaps up when I behold
A rainbow in the sky:
So was it when my life began;
So is it now I am a man;
So be it when I shall grow old,
Or let me die!
The Child is father of the Man;
And I could wish my days to be
Bound each to each by natural piety. ¶*





WHY WE NEED LANDRACE CEREALS?

A Conversation With Annika Michelson

FEATURE

Words: JARKKO LAINE – Photography: JARKKO LAINE and ELIISA KUUSELA

In July 2018, a group of about 60 farmers, millers, researchers, bakers, students, and other people interested in landrace cereals and bringing the neglected crops back into use gathered for a three-day conference in the Finnish countryside.

The event, Nordic Heritage Cereal Conference, took place at Mustiala, Finland's oldest agriculture school, where students have been learning about farming methods since 1840. In its prime, the school was considered one of the best-kept farms in all of the Nordics. Most of the buildings surrounding its courtyards remain unchanged, which gives the visitor a sense of timelessness and tradition.

The conference has been organized yearly since 2008 by an informal network of volunteers—each year in a different Nordic country. As the organizers receive no outside

funding, the preparations are mainly dependent on the effort put in by the year's hosts. This year, the host was HAMK University of Applied Sciences¹, and the person in charge of the show Annika Michelson. She worked tirelessly to plan the program and make it happen, shepherding the participants so we all made it to the event more or less in time, and could focus on landrace grains and all the efforts surrounding them.

Annika teaches environmental and agricultural issues at HAMK, with Mustiala as her workplace. Despite its long history, Mustiala isn't stuck in the past: this year the staff decided to shift entirely to organic farming². And Annika is going even further by centering her research on landrace and heritage cereals. She also actively seeks out heritage varieties from farms around the country, and even outside its borders. Her goal is to build a

1 <https://www.hamk.fi/campuses-and-maps/mustiala/?lang=en>

2 The reasoning for this decision was financial: organic grain can be sold at a premium, while spending less money spent on pesticides and fertilizers.

“THE HUMAN DESIRE IS TO MAKE FOOD AS FAST, CHEAP, AND EASY AS POSSIBLE. AND TO ACHIEVE THIS, FARMERS TRY TO CONTROL EVERYTHING FROM THE SOIL TO THE SEED AND TO THE ENVIRONMENT.”

decentralized gene bank in cooperation with farmers and eventually get these seeds back into production and human consumption.

Just like her professional focus, landrace cereals, Annika is a force of nature. She makes things happen with a fascinating combination of childlike excitement and curiosity. She has a steadfast determination for what she cares about: her friends, the plants.

Annika always seems to have multiple projects going on. Still, she finds time for a warm word or a hug to share with familiar faces she meets. In the time I've known her, it hasn't been uncommon to receive an email at the odd hour excitedly proclaiming her latest finding, be it a new piece in the puzzle that is the history of farming in Finland or a previously unknown rye population she has received from a retiring farmer.

THE PROBLEM WITH MODERN AGRICULTURE

I first met Annika in 2017 as she was beginning the preparations for the conference. Since then, we've stayed in touch, meeting in person and through online communication channels to talk about landrace and heritage cereals, bread, and sourdough.

As I learned more about these cereals and the people who work on them, I started to wonder about their role in society at large. Could these diverse and tasty varieties be more than a curiosity? I realized that while

Annika and others often spoke about flavor, it was just the first selling point—there was more to their determination. To dig deeper, I decided to ask Annika some hard questions.

So, what is the problem with modern agriculture³ that landrace cereals could help solve?

“The human desire is to make food as fast, cheap, and easy as possible. And to achieve this, farmers try to control everything from the soil to the seed and to the environment,” Annika said.

“But can we blame ourselves?” she continued, “Getting food is vital for life and still the main purpose of daily life for people in many countries around the world. And it's hard work. Only the gatherer, hunter, and farmer know what hard work it is to get food.”

“In the industrialized world, the advances in farming practices have turned it into a minor issue and allowed most people to work on things other than growing plants for food. This has led to longer, healthier lives—and so, there's nothing wrong with this development in itself. The trouble is that it is all based on a mistaken understanding of humankind and its place in the world.”

³ While agriculture is done everywhere in the world, the techniques vary widely. Farming millet in Senegal is entirely different from growing wheat in France. Being from Finland, both Annika and I tend to look at agriculture from a Finnish point of view. In this context, organic farming is slowly gaining in popularity, but heritage cereals are still but a footnote.



She went on to explain that the agricultural system is a living process: "The main players in it used to be climate, soil, humans, seeds, and animals. After the second World War, the role of animals decreased as fossil fuels and machinery grew to replace them. It's at this point that humans got a false impression of mastering life and forgot the soil."

"But the soil is like sourdough; it is the most vital factor in producing healthy food. You can see, feel, and smell it. You have to feed the soil. Without food, the soil will die—just like sourdough. Sitting in a tractor placed us too far away from the soil. We no longer had to feel and smell it."

Another part of the problem is the loss of biodiversity. Before the rise of professional plant breeding in the mid-1900s, farmers did most of the breeding by looking for crops best adapted to their hyperlocal environment⁴. This diversity and resilience was lost when plant breeding shifted to looking for a small number of predictable seeds that could be

used everywhere—and sold to farmers at a healthy profit.

"Seed breeders changed the seeds from open pollination to closed and started manipulating pollination. They also started to change the seeds' detailed structures by modifying their genes," Annika said.

Finally, there's the question of climate and how it will evolve in the coming years.

"Agricultural production is easiest in a stable climate where it's possible to predict the results better and plan the agricultural actions. So, it's natural that for millennia, humans have tried to decrease the impact of climate. Today, plants are grown in greenhouses, and even in dark mining caves, and in space," Annika said.

At the scale needed for cereals, bringing the environment under that much control is not possible, however. And the climate is changing rapidly. In this new situation, the highly tuned and industrialized farming practices don't adapt well.

⁴ See Professor Hans Larsson's presentation at Nordic Heritage Cereal Conference for more information: <https://drive.google.com/file/d/1MznKUgEj9tNnpDnGOdDI2akCRiNVSRSS/view>



"Last year, it was too cold and wet in Finland. This year it is too hot and dry." Annika said, "Nature gets stressed, humans get stressed. It's becoming tough to foresee the future climate, and agricultural production fails to deliver. When farmers stop farming, the alarm clocks should start ringing among city people."

In October 2018, the Intergovernmental Panel on Climate Change released their latest report, on the "impacts of global warming of 1.5°C above pre-industrial levels." The document has been widely discussed in the past weeks—and it's hard to overestimate its message: what we saw this year is only the beginning.

"Finns are producing agricultural food in an area that in the European Union is called Less Favourable Area (LFA). We produce food at the edge of the world. That's why we have to change fast if we still want to produce food up in the North. There is also the option to start importing food, but this will make us most vulnerable to political conditions in other countries."

"We are standing on the doorstep to a major change, and few people realize it," Annika added.

HOW LANDRACE CROPS CAN HELP?

But what can be done to respond to the changes climate change, loss of biodiversity, and soil erosion are bringing to farmers around the world?

"There are no easy answers. When we speak about growing cereals, we are talking about big, complex topics," Annika said.

"The Earth is a huge ecosystem that mother nature takes care of and arranges into balance. If some species flourish too much or bring the ecosystem out of balance, the Earth reacts. The reaction causes a change that brings the ecosystem back to balance," Annika said. The question at hand isn't really about the survival of the Earth but of humans as a species."

"The Earth always finds a way and adapts to changes, but will humans be a part of it?"



“LANDRACES WERE DEVELOPED THROUGHOUT MILLENNIA, AND THEY ARE LIVING AN OPEN-POLLINATED LIFE IN AN OPEN ECOSYSTEM. ONLY BY USING THEM WILL IT BE POSSIBLE TO PRODUCE FOOD IN A WAY THAT ALLOWS HUMANS TO THRIVE.”

If the problems arose from trying to master the planet, the solution is to do the opposite and cooperate with nature, Annika suggests: “Landraces were developed throughout millennia, and they are living an open-pollinated life in an open ecosystem. Only by using them will it be possible to produce food in a way that allows humans to thrive.”

This isn’t an easy sell to the broader audience and large-scale farmers, as the yields in landrace varieties are smaller than in what Annika calls “manipulated modern sorts.” But studies at the Swedish University of Agricultural Sciences are proposing that landrace varieties may actually contain more nutrients than today’s common crops⁵. Many speakers at the conference suggested that it would be beneficial to start talking about nutrient density: if by eating more nutrient-rich cereals humans could be fulfilled with less food, the question of yields would be less important.

At the same time, this year’s dry summer showed that in more extreme conditions, the balance in the difference of yield shifts. This summer, with almost no rain, old varieties were able to dig their roots deeper and thrive while modern varieties struggled!

⁵ A. Hussain, H. Larsson, R. Kuktaite, and E. Johansson, “Mineral Composition of Organically Grown Wheat Genotypes,” *International Journal of Environmental Research and Public Health* 7:9 (September 2010)

Where monoculture fails, diversity and locally adapted small populations can survive.

“Landrace grains fascinate me. I admire their diversity and their skill to survive. I admire their strength. They are beautiful. My love for landrace grain is unconditional,” Annika told me.

CAN LANDRACE VARIETIES FEED THE WORLD?

This all sounds promising and worth exploring, but I couldn’t leave it there. I wanted to know if there is something about the “green revolution” that we will still need in the future.

Annika’s response was sharp: “I do not know if it’s possible to feed the world in the future with organic and landraces, but I know that they did feed humans in the past. I think the world and life must change. Mother Earth will force us to change. She does not negotiate with humans. She treats us in the same way as she treats any other living being in the ecosystem.”

She continued with more optimism: “Humans can do a lot to bring the balance back into the ecosystem of Earth. We are pretty clever, and we can use our skills to build a sustainable life.”

This would mean that more people will have to start producing their own food, also in the industrialized world:

“We have to replace the lawns with cereal



fields, also in private gardens. People living in towns will also have to start cultivating part of their own food. We have to start teaching farming in kindergartens, primary, and secondary schools."

For Annika, this is an exciting prospect.

"Some may see this as a drawback, but I see it as a development to find balance and sustainability. Mother Earth is humans' main cooperation partner. She gave us good tasting landrace grains, and I am grateful for that," she said.

"Perhaps my soul is old, but I like old simple systems. For me, it is important to see the whole ecosystem. To see the beginning and the end. A small change in one part of the system may result in a huge change in another part of the system. I believe that changing into the use of landraces will play such a role. We call it the grain revolution." ♣



Cereal Projects in Europe

Here are some projects from Europe that were presented at the Nordic Heritage Cereal Conference, working to map, advance, and promote the conservation and use of heritage and landrace cereals.

Check them out for inspiration and ideas on what could be achieved.



LET'S LIBERATE DIVERSITY!

The European Coordination for Let's Liberate Diversity! is an international non-profit organization created in 2012 for coordinating the work of national networks and other members to encourage, develop and promote the dynamic management of biodiversity on farm and in gardens.

One of their most exciting projects is the work on evolutionary plant breeding, which aims to help farmers find the varieties best suited for the specific environment of the farm doing the breeding.

<http://liberatediversity.org>

CEREAL RENAISSANCE IN RURAL EUROPE (CERERE)

CERERE is a network of scientists and communities of practitioners that aims to dig the gap between research and practice in introducing and managing agrobiodiversity in cereal production. These innovations are rooted in local traditions, knowledge and food culture.

On their website, you'll find publications, instructions, and information about the network's events around Europe.

<http://cerere2020.eu>

SCOTLAND THE BREAD

Co-founded by Andrew Whitley, Scotland The Bread is a collaborative project (created by plant breeders, farmers, millers, bakers, nutritionists and citizens) to establish a Scottish flour and bread supply that is healthy, equitable, locally controlled and sustainable.

<http://www.scotlandthebread.org>

FARMER'S PRIDE

Farmer's Pride is a European Union funded project building a collaborative network for on-site conservation and sustainable use of Europe's plant diversity for food, nutrition and economic security throughout the region.

<http://www.farmerspride.eu>

DYNAVERSITY

DYNAVERSITY analyses and describes the actors involved in plant genetic conservation for agriculture in order to suggest management and governance models and to construct new forms of networking. It facilitates exchange and integration of scientific as well as practical knowledge on how to best manage diversity in agriculture and in the entire food chain, restoring evolutionary and adaptation processes.

<http://dynaversity.eu>



DIGGING INTO SOURDOUGH CULTURE WITH IAN LOWE—PART 2

CRAFT

Words: BARBARA ELISI CARACCIOLLO — Photography: ISTOCKPHOTO and JARKKO LAINE

In the previous issue of BREAD Magazine, I started a discussion with Ian Lowe—founder and owner of Apiece¹, a bakery in Launceston, Tasmania. We explored the basic aspects of sourdough biochemistry and maintaining a sourdough starter.

In this follow-up, we will go deeper still on our guided tour to our favorite friendly micro-organisms. You will learn about sourdough pH, Ian's favorite way to start a new sourdough culture, fruit yeasted waters versus wheat-based cultures, young versus mature sourdoughs, and more.

There's quite a lot of detail, which I am sure will please your geekiest side². So, get a good cup of your favorite beverage—strong coffee for me—and open your mind to more of the wonders of sourdough cultures.

ACIDITY OF SOURDOUGH

Bread Magazine: To begin, I'd like to focus on the pH of a sourdough starter. We often hear about it, but what are we really talking about when we talk about the acidity of a starter?

Ian Lowe: The "strength" of an acid, expressed on the pH scale, relates to the number of free hydrogen ions a particular type of acid donates to a solution.

Let's look at acetic and lactic acid, the two most abundant acids in sourdough cultures³: One gram of lactic acid is more "acidic" on the pH scale than one gram of acetic acid because lactic acid releases hydrogen (deprotonates) more efficiently than acetic acid. This means that per gram of acid present, lactic acid will lower a solution's pH more quickly than acetic acid.

1 <https://www.instagram.com/apieceofbread/>

2 Full references for this article are printed at the end of this issue.

3 See BREAD Magazine issue 21, pp. 72-80 for part 1 of this series with Ian Lowe.

BM: And what is then a suitable pH for a dough?

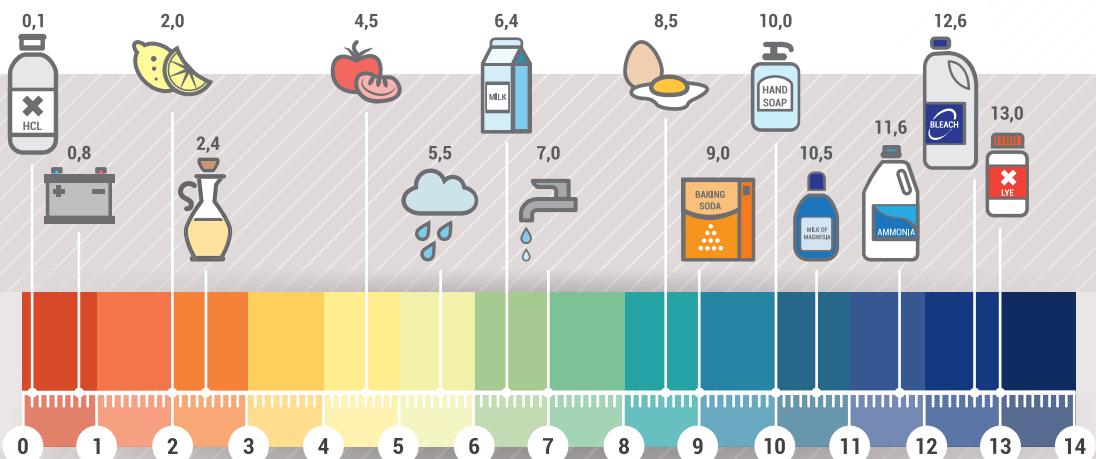
IL: pH is one variable for manipulating the ratio of different cell populations relative to one another. *Triticeae* grain flours (rye, spelt, bread and durum kinds of wheat) all have a pH above 6.0 when mixed with water. This corresponds to the ideal range for those lactobacilli most adapted to the sourdough environment.

By prefermenting a portion of the dough, you effectively lower its pH. So, the starting pH of the next fermentative step could be much lower than 6.0, depending on the amount of flour prefermented and the degree of fermentation. The more you preferment (or the larger the rate of inoculation), the larger the amount of pre-acidified flour you introduce into the next fermentative step. This favors sourdough yeast growth (*Candida/Kazachstanica*, specifically, as *Saccharomyces* species tend to prefer higher pHs) and homo-fermentative bacterial growth. Heterofermentative lactic acid bacteria growth is instead favored at pHs above 4.5.

BM: Regarding feeding schedule, I have heard people complain about too acidic starters. What does this mean?

IL: pH impacts a sourdough culture most fundamentally when the culture is infrequently refreshed, particularly if stored above 4°C at the point when the final pH of a sourdough reaches sub-lethal conditions for heterofermentative lactobacilli (below pH 3.8). This is never a concern if a culture is refreshed on a daily basis, but infrequent refreshments can easily shift a type-I culture into a type-II.

Sourdoughs always contain several times more lactic than acetic acid. What changes is the total amount of acetic acid. So, when we use wetter doughs and whiter flours, we are limiting the total production of both acids, which leads to barely-detectable levels of acetic acid. Conversely, using stiffer doughs and more whole-grain flours increases the amount of acetic acid (and at the same time that of lactic acid, which is always greater).



The pH scale with some everyday examples.

“THERE’S A THEORY IN MICROBIOLOGY THAT EVERYTHING IS LITERALLY EVERYWHERE. THIS SEEMS TO BE THE CASE WITH *LACTOBACILLUS SANFRANCISCENSIS* AS WELL.”

ON THE ORIGINS OF SOURDOUGH MICROORGANISMS

BM: Where do our friendly microorganisms come from and what is the best way to start a sourdough culture?

IL: A lot of interesting research on this subject has been published in the last three years, all trying to address one of the least-understood sourdough phenomena: where do the dominant microorganisms in type-I sourdough starters come from?

There’s a theory in microbiology that everything is literally everywhere. This seems to be the case with *Lactobacillus sanfranciscensis* (Lb SF), the dominant organism in wheat and rye sourdoughs, as well.

Lb SF was first described by Sugihara and Kline in 1971, and until three years ago, it had never been recovered outside of the sourdough environment. This led many researchers to believe that it was a domesticated organism. However, in the last three years, it has been found in places like the GI tracts of blue parrots and humans, as an endophytic member of durum wheat kernels, in the fecal matter of pigs and dogs, in green-olive fermentations, and in a natural whey culture used in Grana cheese production.

Just last month, a study was published that recovered the species from a traditional bean fermentation in Southeast Asia.

One prominent researcher, Michael Gänzle, recently published an interesting article on sourdough starters established using plant material, especially flowers, plant buds, and mother of vinegar. The starters were created with flour, water, and the addition of 20% plant material to flour weight for the initial, spontaneous fermentation. After just four refreshments with only flour and water, fully-established sourdough cultures were created in all seven samples, with four of the samples harboring Lb SF as the dominant organism. This was a first in a laboratory setting. However, the yeast genera involved were atypical (but not necessarily undesirable) sourdough organisms.

There have been several other studies that used different adjuncts to begin a sourdough culture, including various fresh and dried fruits, yogurt, and honey. The conclusion seems to be that the organisms that ultimately become dominant when using additions are probably better adapted to their source material than a grain environment. The long-term stability of these cultures and whether they shift over time toward a more typical sourdough consortium is still not known.

The best research on the ecology of Lb SF has been done by a group of Italian scientists. Lb SF belongs to a fructophilic clade of lactobacilli associated with the fruiting bodies and/or flowering organs of plants and

their insect pollinators. In the last two years, these researchers have definitively shown Lb SF's whole life cycle revolves in, on, and around C3 cereals and their insect pests.

THE FASTEST WAY TO CREATE A SOURDOUGH STARTER

BM: You mentioned adjuncts to sourdough cultures, like dried fruits and honey. Is that your favorite way to start a sourdough culture?

IL: Actually, I prefer to create a starter by using only flour and water. If a baker ignored hydration and rate of inoculation—that is, if she was to use arbitrary amounts for each—but began a culture by following the already-mentioned two rules (always keep between 22°C (72°F) and 30°C (86°F) and refresh at least daily), she would arrive at healthy, active type-I sourdough somewhere between the 10th and 15th refreshments.

BM: I have heard of cases of new fully active sourdough cultures created in much shorter times. How can that happen?

IL: The easiest way is by using very warm temperatures for the initial fermentation, somewhere between 35° to 40°C (95°F to 104°F). Using whole-grain flour for this first step also helps, particularly rye, as it contains higher amounts of bacterially-preferred substrates than wheat flour.

By using elevated temperatures for the spontaneous fermentative step for 24 to 48 hours, homofermentative bacterial growth is maximized, as well as their main metabolite, lactic acid. Maximizing acidification and quickly lowering the pH of your flour-water mixture limits the growth of undesirable organisms.

The next fermentative step (first refreshment) is done at 32°C (89.6°F) for about 24 hours, which begins to maximize heterofermenter growth. Yeasts are slower to establish their cell numbers since their presence first requires a sizable bacterial population, and so they are not present in full until about

the fourth or fifth refreshment.

The second refreshment is done at 30°C, with all ensuing refreshments done between the recommended range of 22°C to 30°C. If the top-end of this range is used (30°C), a culture will become stable and fully viable after a shorter number of refreshments, usually about seven.

This method is really only for those who wish to quickly establish a starter, which can sometimes be a good thing.

BM: Well, yes. We always fear that we will "kill" our starters, don't we? A reliable shorter method can be of help in such cases. Has that ever happened to you?

IL: When I first opened Apiece, and the bakery was just me, my mom came to visit from the States. She's a neat freak, and so she was busy tidying the bakery, doing any dishes she could scavenge and helping with odd jobs. It was the end of a long day, which I always end by refreshing the starter.

I dumped out all the excess starter I didn't need, leaving behind just enough to inoculate the next batch, and then did some quick cleaning and took out the trash.

When I was finally ready to mix the starter, I freaked: where was the starter bucket? I looked at my mom, who was happily humming and doing dishes.

I panicked: "Mom, did you see the clear, plastic bucket with the white lid?" She beamed, saying, "Oh, the one with the old dough bits? I washed it for you!" She'd unknowingly thrown out the starter, washed away any remnants, and the trash was already taken out!

It took me three days to establish a new one from scratch.

“FRUIT-BASED FERMENTATIONS ARE YEAST-DOMINANT, AS YEAST CELL DENSITY IS DIRECTLY CORRELATED WITH SUGAR CONTENT.”

DIFFERENT KINDS OF STARTERS

BM: What is your opinion on fruit-based wild yeast? Do you think there is a qualitative difference between them and a sourdough culture born from water and flour alone?

IL: I think any “natural” fermentation is great and I encourage bakers to use as many different such leavening sources as possible when making bread (water or milk kefir, fruit waters, and so on), knowing that the ultimate product will not be as tasty or interesting as when using a type-I starter specifically adapted to the grain conditions.

Fruit-based fermentations are yeast-dominant, as yeast cell density is directly correlated with sugar content. Most grains have less than 2% total sugar, whereas fruits range between 8% and 20%, which can support much higher yeast populations (still far below that achievable when using industrial yeast). Interestingly, there will also be lactic and even acetic acid bacteria in the mix, depending on how the fruit-based culture is fermented. In studies on this subject, the best results have been found in fruit-based waters that are refreshed, selecting for well-adapted yeast species that contribute substantial gassing power when some of the water in the final dough is replaced with the fruit water.

As a supplement to traditional sourdough, the use of fruit-based yeast waters—particularly those that are continually refreshed—is interesting. It's one way of “naturally” boosting carbon dioxide production, which might be desirable for “whiter” or sweeter, lighter baked products. The flavor



Fruit-based wild yeast made of various fruit.



Stiff sourdough starters packed tightly in cloth.

and texture will be closer to a yeasted product than sourdough, but I think "natural" adjuncts are far preferable to the industrial alternatives. For one thing, they are free!

BM: How about dough development. How does the starter influence it?

IL: "Strength" in wheat doughs refers to how the various components of flour (starches, fats, proteins and non-starch polysaccharides) bind with themselves and how they bind water. Sourdough organisms mainly impact dough rheology indirectly, mostly as a result of their metabolic byproducts, like carbon dioxide, exopolysaccharides, extracellular enzymes and organic acids.

Carbon dioxide isn't usually listed as something that impacts the way a dough behaves, but it has significant consequences. Gas released during fermentation fills the nucleation sites of air bubbles created during the mixing process, causing them to aerate and expand. This increases the overall volume of the dough, stretching out gluten proteins by causing elongational stress. This expansion decreases overall viscosity, allowing doughs to "flow" and deform more readily.

The primary way lactobacilli mediate dough strength is through the production of organic acids and by altering a dough's pH. Organic acids cause every fraction of the wheat kernel to swell, allowing for more water-binding sites. This means the dough can uptake significantly more unbound water as its pH drops. When free water becomes bound, from a baker's perspective, dough strength increases.

Protein strands expand in the presence of organic acids, enabling increased bonding with free water and with other dough constituents. Organic acids, though, also lower pH, which kicks proteinogenic enzymes into overdrive at pH 4.5, at which point the gluten proteins begin to break down.⁴



⁴ Proteinogenic enzymes in wheat become active at pH 4.5 and exponentially catalyse more reactions before reaching their peak at about pH 3.8.

“I ENCOURAGE BAKERS TO THINK OF CELL POPULATIONS: WHAT IS THE TOTAL QUANTITY? WHAT IS THE RATIO OF BACTERIA TO YEAST? AND AT WHICH STAGE OF GROWTH IS EACH AT?”

The consequences? A good sourdough baker has several considerations to attend to during bulk fermentation. She must carefully balance the production of carbon dioxide (the result of yeast and heterofermentative bacteria) and organic acids (primarily from bacteria) to arrive at the appropriate amounts of both. A sourdough baker aims to finish bulk fermentation just as a dough enters its peak strength, so that, during shaping, it can remember the shape of its final, baked form.

Enough carbon dioxide must be present to ensure a well-structured, light loaf. So, too, must there be enough acid present to allow for the uptake of unbound water and to decrease the dough's tendency to pancake as it becomes aerated. But, if there is too much acid before enough CO₂ has been produced, the pH will drop too far, and the dough will fall apart in a gloopy puddle of gluten soup!

Since the production of carbon dioxide and organic acids are linearly correlated with temperature, from 22°C up to 28°C (72°F to 82°F), the simplest way to achieve this balance for the amateur baker is through the use of warmer fermentation temperatures.

YOUNG AND MATURE STARTERS

BM: Do you prefer using a so-called young starter or a more mature one in your bread? Or does this depend on the type of bread you are making?

IL: Classifying a starter based upon time or age (i.e., “young” versus “mature,” “green” versus “ripe”) is based on a false distinction.

Bakers like to think in terms of time, but in what way is this helpful? It’s not informative. A dough that’s fermented with 10% salt for ten hours will be different than one fermented with none for the same amount of time. A dough retarded for 24 hours will be vastly different than one maintained at 35°C (95°F).

Instead, I encourage bakers to think of cell populations: What is the total quantity? What is the ratio of bacteria to yeast? And at which stage of growth is each at?

A sourdough leaven is merely a way of manipulating the ratio of cells (bacteria to yeast) in a culture and determining the total number of cells that will populate the next fermentative step. In this sense, a “young” leaven is simply one that hasn’t achieved the maximal number of cells the leaven’s flour can support. Why not just use a much smaller amount of a fully “mature” leaven to begin the next fermentative step with the exact same cell population as that found in a higher quantity of “younger” leaven?

There are certain theoretical benefits to this approach over a “young” starter, like minimizing lag-phase and using a culture that’s

fully in logarithmic growth, and the results would be the same but with less under-fermentation occurring—the bane of “young” starters when not managed correctly.

I find this way more helpful when thinking about what I’m trying to achieve and how to do it using many of the variables I’ve discussed, such as temperature and pH. Time is merely a consequence of these interactions. Before I begin the next fermentative step in any production, I ask myself: Have I reached the cell population I want to achieve in this step? Do I have the ratio of bacteria to yeast I want? Are they at a stage of growth that minimizes lag-phase and ensures active growth in the next step in my process?

It may surprise many readers that the answer to these questions requires using sensorial and experiential cues rather than putting on a lab coat and goggles. I do not use the float test (this merely measures the presence of carbon dioxide, and also only works for white, liquid starters), nor do I measure the volume gain of the starters. Neither tells you much about the nature of the culture.

Anyway, we try to use maximal cell populations before beginning any fermentative step that might follow. For hearth loaves, for example, we only use stiff, whole-wheat starters that are refreshed at 26° to 30°C (79°F to 86°F), depending on the season, and allowed to ferment for 12 to 18 hours.



“I DO NOT USE THE FLOAT TEST (THIS MERELY MEASURES THE PRESENCE OF CARBON DIOXIDE, AND ALSO ONLY WORKS FOR WHITE, LIQUID STARTERS), NOR DO I MEASURE THE VOLUME GAIN OF THE STARTERS.”



BM: You seem to prefer stiff starters to liquid ones, why?

IL: I prefer stiff starters over liquid ones because they produce a more flavourful end-product. That's mostly because there's less substrate dilution.

I like to push my bread starters far beyond the point most bakers do, partly because logarithmic growth continues well after a starter's flour breaks down due to proteinogenic enzyme activity. Visiting bakers are always surprised by just how strong-smelling our starter is—it has an intriguingly fruity, red-wine-like aroma and a massive dose of acetic acid when we think it's "ready"—and they are even more surprised by how balanced and mild-tasting the resulting bread is.

The idea that a "mild" and "young" starter will create "mild" bread is inherently false. It's the final dough conditions that determine a

bread's taste, not the starter. Particularly, it's wherever (and however) the culture spent its last two to three generations and the accumulated metabolic by-products from those generations that most determine the outcome of the final product.

TERROIR IN SOURDOUGH STARTERS

BM: Do you believe that a starter can keep its characteristics if moved to a different environment and fed at different intervals and using different water and flour than its original ones?

IL: Of all the ecological drivers behind sourdough community assembly, the one that's the least understood is dispersal, a term for how organisms move across space. This relates to the earlier topic of exactly where sourdough organisms (especially Lb SF) come from, or, more specifically, by which vectors they are dispersed to end up in the sourdough matrix.

The other primary determinant of sourdough ecology, selection, is better understood, partly based on similar research in other food fermentation systems such as cheese. Selection is another way of saying the process parameters bakers employ and the way that interacts with an organism's phenotype across generations.

One key component that affects dispersal is the idea of a house microbiota. The more (both in quantity and frequency) you ferment naturally the more sizable population of the fermentative organisms involved you build up at the place where the fermentation occurs. This population then continually recolonizes any future batches of the same fermentation, even "contaminating" outside raw materials brought into the environment, such as bags of flour.

A house microbiota is a mighty selective force. It's been discovered in every type of natural food fermentation that uses continuous processing, such as cheese, wine, sourdough, and so on.

It's also well-documented that contamination events can drastically impact a sourdough's microbial consortia. One of the best examples of this is in Italian bakeries where commercial yeast is used. The sourdough starters of every bakery studied that also uses industrial yeast contain wild mutagens of *Saccharomyces cerevisiae*, whereas the starters from bakeries that do not use any commercial yeast are virtually free of this species.

If I was to give my starter to another sourdough baker, I have no doubt it would quickly become similar to hers, mainly owing to the impact a house microbiota has in addition to her refreshment regime. In fact, one of the main reasons sourdough cultures can show remarkable species stability over decades is likely due to this effect: a culture will be refreshed in the same place and in the same way year after year.

As to whether a microbial "terroir" exists—that is, whether there is any correlation between geography and a starter's microbial consortia—it's highly unlikely, in part because everything is everywhere.

BM: That is my experience as well. When I gave my starter away, it soon looked different and seemed to behave differently. I am also very aware of the issue of cross-contamination between different starters so I tend to limit the amounts of starters I keep. How about you? How many different starters do you generally keep and why?

IL: Only one, because any more than that is unnecessary if dietary restrictions are not a consideration⁵. We use one "house" starter that we manipulate at the dough-starter (leaven) stage to create as many different products as possible.

WILL THE INDUSTRY FOLLOW OUR LEAD?

BM: Do you think the bread industry will ever be able to reproduce the long fermentation process achieved by artisan bakers (professional or not)?

IL: Your question has several answers. In a very narrow, literal sense, the answer is quite assuredly, yes. Long fermentations lasting days are easily accomplished through technological means like refrigeration. There are bread factories in Russia and Europe that make sourdough rye bread employing starters fermented for up to five days. Most mid-sized to larger-scale artisanal bakeries place their sourdough starters in a temperature-controlled room. These starters likely ferment much, much longer than anything I would ever use, maybe twice as long.

Is their bread therefore twice as good?

For me, time is not an indicator of good bread. Think about the system Poilâne uses: one batch of their signature miche — about a hundred 2.2 kg loaves — only takes three hours from bowl to bake. Their system uses continual processing where one-third of the previous dough is held back, fermented for two hours, and then used to start the next batch. Every three hours, batch by batch, 365 days a year. This equates to about 85% to 87% starter when adjusted for their bread's hydration. Because they use such a large cell population to begin the next fermentative step, the dough only requires the culture to undergo one generation in the final dough before being baked.

Another way of thinking about it is to see that the time is in the preferment. It takes time to build a sourdough culture from scratch and even more time to continually refresh it. It takes time every day to attend to the needs of the billions upon billions of cells in a gooey starch paste, to continually give them the conditions necessary for life. It's not so much about the length of time fermenting but about the amount of time spent being hands-on, about having humans involved in the process.

⁵ Even here, it only takes eight refreshments to completely transform a wheat starter into a completely gluten-free one.



To answer the question I think you're really asking, it's doubtful. The industry doesn't have history on its side. When it comes to food production, I cannot think of a single example where industry does it better than the small guy, and it's not even close. In fact, it's quite the opposite, which is to be expected. We seek good food out of pleasure, so its quality is judged on very different motives than what drives commerce. Industry is what we let it be, so if we do not want our food to be a commodity, we must work to make it so and to put the human element back into it.

BM: Finally, are we going to see a book from you soon? I know many are waiting... Including me.

IL: One day—likely not soon—yes. It will not be like any other book written thus far. My goal is to teach bakers to formulate any loaf of their choosing, from scratch, using any flour and any method of (un)leavening. This is a tall order. Most bread books contain static recipes representing one approach—the author's, but there is an infinite number of ways of making a baguette.

I want to teach people the fundamentals, far beyond what's been written before, with most of the concepts original to me, so the readers are freed from prescribed ratios and can thus create their own formula based upon whichever end result they choose. ♣

3'33

Ian Lowe's Basic Sourdough Bread

FORMULA

Words and Formula: IAN LOWE

WHOLE-GRAIN STARTER

INGREDIENT	QUANTITY	BAKER'S %
Whole-grain flour	113 g	100%
Water	113 g	100%
Ripe, refreshed and fermented starter	34 g	30%
Salt	1.6 g	1.44%

FINAL DOUGH MIX

INGREDIENT	QUANTITY	BAKER'S %
Flour, roller-milled	263 g	100%
Water	165 g	63%
Starter (all of the above)	263 g	100%
Salt	5.5 g	2%
Malted barley flour	4 g	1.5%

“33% OF THE TOTAL FLOUR IS PRE-FERMENTED, AND THIS FORMULA CAN BE USED TO MAKE A TASTY LOAF IN JUST 3 HOURS”

This formula is the kind of bread I like to bake at home on my days off. It's cheekily named 3'33—in reference to John Cage's infamous piano piece—because of two simple properties of the formula: 33% of the total flour is pre-fermented, and this formula can be used to make a tasty loaf in just 3 hours (if fermented at 28°C (82°F)). The result is a surprisingly uncomplicated, rustic loaf with robust acidity and fantastic volume.

The approach found in this bread borrows heavily from two my biggest influences, Poilâne and Jim Lahey. Both these bakeries employ room-temperature-only fermentation and pre-ferment a large amount of flour in the dough, resulting in a quick turnaround time. The salt in the starter is a Lahey trick. By decreasing bacterial cell viability, the starter can be fermented overnight without breaking down the flour as much as it would were the salt not present.

For the dough starter, choose any whole-grain flour of your choice. It doesn't really matter. Rye or wheat, or emmer or spelt, or whichever you choose. Stone-ground is preferable, local even more so. Mix the starter the night before you plan to bake. Desired temperature is 28°C. Be sure to add the salt! Although the malted barley flour is not necessary, I'd strongly recommend its inclusion.

For the roller-milled flour, I prefer wheat flours that produce a creamy, yellow colour when hydrated and have only moderate protein and elastic values (11-12% total protein). An all-purpose flour from a reputable mill works great.

The next day you are ready to mix the final dough. This can be done by hand or in a stand mixer. Your choice. If using a stand mixer, use the paddle attachment. Mix on low speed to combine all the ingredients, then turn to high and mix until the dough comes away from the sides of the bowl. If mixing by hand, use whichever method you are most comfortable with, noting the more you develop this dough, the better it'll be. I'd personally slap-and-fold, but it's up to you.

Your desired dough temperature is 28° to 30°C (86°F). This dough will spend between 1 hour 45 minutes to 2 hours in bulk fermentation at that temperature—longer in winter or when it's cooler. Folds should be given at the 10 minute, 30 minute, and 50 minute mark. When shaping, degassing will not hurt the end result. I usually shape the dough into a simple round. The final, shaped bread spends between one hour to 1 hour 20 minutes in final fermentation, depending on the temperature and how good your bulk was.

Bake hot! ♣



WHAT'S NEXT?

Special Readers' Issue 23: Bread Diversity Around the World

In the course of this fall, we'd like invite you to be a part of our team and contribute to the upcoming issue 23 of Bread Magazine.

What would you like to learn from the community and the world of bread-making?

What questions leave you frustrated, unsatisfied, and yearning for more?

Where do you get stuck?

What would help you resolve your bread-related pains and problems?

In this forthcoming "special" readers' issue 23, we'd love to create a magazine that will echo your experiences, stories, and insights, truly bringing the community together as a whole.

We'll leverage all media and formats that can help us all better experience, learn, and share what bread-making means to us, and how we can grow as humans and as a group of people passionate about bread-making.

These contents include digital and print magazines, social media, blog posts, text, photos, videos, etc.

The topic for our next issue is "Bread diversity around the world." We're looking for short stories, photos, videos — anything that you'd love to share with other readers and that tells something about the locally, culturally, and historically rooted dimension of bread and of bread-making.

The best way to start is to post on social media using #breadaroundtheworld (on Twitter, Instagram, and Facebook). We'd love to hear about how bread is lived, experienced, made, tasted, shared, sold, etc. in your local community — be it physical or virtual.

Look out for the Facebook group "Bread diversity around the world," and join us there to create a lively discussion, and to share inspiring content.

Happy baking!

Thank You

BREAD Magazine is a labor of love by a small team of dedicated bakers, writers, and publishers. It's a fiercely independent magazine, and as such, it relies on the support of readers and subscribers to remain true to its vision. Every reader counts. Thank you for your support!

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