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WELCOME

Putting an issue of Bread Magazine together is a window into the trends in the world of bread making—especially now that I'm working with a team of writers who all look at bread and baking from their individual perspectives.

When we started creating this issue, I sent out a very loose call for writers to propose articles on bread related topics they found interesting. But now, with the issue completed, when I look at the table of contents, it's almost as if we built the magazine around a common theme: More than half of the articles touch grains and sustainable farming practices in one way or another!

That shouldn't be surprising.

While grains are crucial for bread making, in the past year or two they have increasingly found their way to the discussion in bread making groups and home bakers' communities—and are now finally breaking into the general public's awareness.

We are awakening to an understanding that using refined white flour for the majority of our baking has been a mistake in terms of our health. At the same time, research saying that maybe we have gone too far in creating the perfect, pest-resistant wheat, is piling up (see *page 82*). To keep us all healthy and our economies viable, we need to take a step back towards a more diversified agriculture, using locally-grown old grain varieties.

But while I rejoice for the movement, I also see some obstacles in the way of turning this interest into a real change.

Educating and inspiring the general public requires a big push, one that I think is possible, and one that will make a huge difference when done right.

But to do it, we need cooperation and an abundant world view instead of protectiveness and fear.

In the past few months, I have milled most of my flour myself. It's been a fun experience, but more importantly, it has changed how I approach bread and grains. Before giving home milling a try, while I was interested in different grains and flours, I felt that they were out of my reach. And so, in practice, I almost always baked my bread using the same handful of favorite flours. My interest in grains and wholegrain flour was mostly theoretical.

Soon after grinding my first batch of wheat flour, I realized I was no longer limited to just that. I bought some spelt, a kilo of buckwheat, and right now, I'm fascinated by Emmer, experimenting with making a sourdough bread with nothing but the ancient wheat.

The more I learn about grains and the potential for variety, the more I'm also getting frustrated by how limited the selection in the stores is, and how little information I can get from the packaging. What good is a package of wheat flour that only says "wheat" with no distinction of the type of wheat used to make the product?

Today, flour—just like bread—is still seen as a commodity (and grains as nothing more than the ingredient for making flour). While there's nothing wrong about that per se, the downside is that we don't usually expect high quality from our commodities. Farmers grow what we, as a society, buy. And we buy what is easily available for us.

Artisan bakeries, artisan mills, and home millers have the chance to change all of this. If we just combine our forces and look at the market from a new point of view—with the shared goal of making good, healthy food that is environmentally friendly and good for the community as a whole.

One example of this is Thierry and Cécile Hermeline (read more about them on page 7), a baking couple from France who also grow and mill the flour for their bread.

Initially, the trade of farmer-miller-bakers in France grew from the need to supply more bread to the people in cities than could be produced by the strictly regulated city bakers. Today, however, these bakers who control the entire supply chain from field to table are leading the move towards sustainable farming practices and bringing back the once forgotten wheat species from their regions.

Also, if milling my own flour has already changed the way I look at grains this much, I can only imagine how the demand for a variety of grains would explode if the idea went mainstream and there was a mill in every home.

This is where fear comes into play.

At every step of the supply chain, the producer can feel that he or she is arming the competition and cutting his or her profit: A baker selling might not want to sell flour in the fear that people will stop buying bread. A miller might not want to sell home mills in the fear that, in some time, there will be no one left to buy her flour.

But if we look beyond the fear and see the market as abundant rather than limited, we can achieve great things.

First, instead of buying flour in bulk, bakers could—together with millers—work with farmers to encourage them to grow high quality, local grain varieties that are better for the customers as well as the environment. If bakers milling their flour sounds like too much work, why not bring in a miller to work at the bakery, side by side with the bakers? After all, there's no denying that milling is a craft in itself and requires time to master.

This, in its own, should encourage farmers to start growing some of the less proven wheat varieties. But the next steps are what I believe would lead to a revolution.

In addition to using this flour for their bread, the bakeries could sell it to consumers who like to bake their own bread. Optimally, the flour would be ground at the very moment it's bought so that the home bakers could get a feel of what fresh flour is like. And finally, the bakery could sell a mill to the customer—and the grains to go with it.

In this setup, the customer would always come back: for bread, for flour, or for grain, depending on where he or she is on the continuum of grain lovers.

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As I walk past empty storefronts at our near-by shopping center, I like to think about what kinds of stores would fit there. I've had visions of restaurants for children, small cafés, co-working spaces, and bookstores. But lately, I've been seeing something different, inspired by an idea our contributor Barbara is soon launching in Stockholm: a flour shop that sells the whole range of products from grain to home mills to specialty flours to products made of the flour. Just like the best coffee stores work today.

Could that be a way to empower farmers and make grains trendy and interesting?

If you have questions or feedback—or you want to comment on this idea, don't hesitate to get in touch.

Thank you for reading, and happy baking!

Jarkko

Thierry Hermeline flours the bread before baking it.

THE FARMER, THE MILLER, AND THE BAKER

Words and photos: FRANÇOIS THIBEAULT

The dough glued to my hands and the workbench. Forty kilograms of a high hydration dough, made with wheat milled the day before, fermented with a natural levain, and kneaded only a few minutes in an old, French-style oblique mixer.

I had thought I had learned something from the previous bake shift, but I still couldn't shape it correctly.

"Shaping the dough is not something you impose from the outside. The dough knows its shape. You have to let it happen with just a few, quick but gentle moves." Thierry Hermeline told me.

I watched him pick a piece of dough. With a gentle but firm touch, he stretched it, folded once or twice, then shaped it into a bâtard loaf. As he went on shaping the loaves, he placed them in linen-covered wicker baskets (bannetons) or straight onto folded linen canvases. Pressing one of these loaves with a finger, I could feel the softness of the dough as well as its strength and springiness.

The shaping seemed simple to do, but it was not easy.

"Shaping the dough is not something you impose from the outside. The dough knows its shape. You have to let it happen with just a few, quick but gentle moves."

Here I was, a traveling baker apprenticing with a master farmer-miller-baker in Normandy, France. Thierry and Cécile Hermeline had invited me to learn everything they could teach me about old-fashioned, organic, naturally leavened bread made with freshly milled flour and baked in a wood-fired oven.

I felt privileged.

But now, halfway into my apprenticeship, I had to come to terms with my inability to shape acceptable loaves. I had to relearn the basics that I had taken for granted.

I knew the family would need me a few weeks later during the Arts Festival at La Perrière, during which they would bake bread continuously for 48 hours. I was ready to relearn how to feel the dough "from the inside out," and to start again at each moment, in spite of my mistakes. I felt an urge to prove to myself, and to my mentors, that they had not taken me as an apprentice in vain.

I wanted to be a dedicated learner, and my goal was to repay my debt towards my mentors by offering as much help as I could.

❊ ❊

In the early summer of 2014, my wife, our two children and I arrived in Paris, our first stop on a one-year journey in Europe and Asia.

Our plan was to discover and experience the world as a family and to figure out a sustainable lifestyle for ourselves. As a university academic, I needed to breathe some fresh air. We had to take advantage of a once-in-a-lifetime opportunity, and becoming nomads for a year was just the right experiment in sustainability.

I had been a home bread baker for several years and even worked as a baker in a craft bakery in Savoie, France, fifteen years ago. Bread was, and still is, one of the mediums that connect me the most with the elements, people, and myself. I was eager to pursue what I called the *"Bread Trail."*

Our plan was to discover and experience the world as a family and to figure out a sustainable lifestyle for ourselves.

To begin our European tour, we bought a camper van in Paris, and in late June, we were happy to hit the road. We drove our 1981 Bedford to the Perche Regional Park, in Normandy.

The Perche country was the home of pioneers and early settlers who left France and colonized New France in the 17th century. Strolling in the Réno-Valdieu national forest, we took refuge under its 350-year-old oaks and paid our respects to the Notre-Dame de Montligeon Sanctuary. The bucolic atmosphere, the heart-warming patrimonial houses and farms, and our slow progression aboard the Bedford through the meanderings of the narrow roads echoed my thoughts that we had indeed traveled to a special place.

A pilgrimage, as it were.

There, in Perche, we connected with friends who told us that we could find good bread at *La Grande Suardière*, Thierry and Cécile Hermeline's farm, close to the nearby village of La Perrière.

The sign on the side of the road read: *"La Grande Suardière: old-fashioned bread baked in a wood-fired oven."*

An old barn was rebuild and converted into a mill and bakery.

An apricot tree shaded the main entrance of the boutique shop, where clients lined up to be served by Cécile Hermeline. In the bakeshop behind, Thierry Hermeline unloaded loaves from a wood-fired oven, filling large wicker baskets with country style bâtard-shaped hearth loaves, multigrain round miches, sunflower, poppy and sesame seed baguettes, pan-baked spelt loaves, as well as many other types of specialty bread. Pizzas and fougasses cooled on racks, alongside brioche breads.

On one of these racks laid a majestic, four-kilogram country style hearth loaf. To be sure, this was a loaf that honored an ancient craft. The fully developed loaves filled the air with diverse and complex aromas.

A combination of roast, cereal, soil, and vegetation-like fragrances emanated from the bread display.

I remember thinking to myself: "There is something going on here that I do not understand."

My intuition was telling me that this bread and the way it was made possessed something that I wanted to learn.

Thierry joined us for lunch aboard the Bedford, where we discussed my plan to visit craft bakeries and meet their artisans. He told us he was a baker who became a farmer and a miller. I assumed that his conversion to farming and milling explained some of the secrets behind his bread.

Cécile Hermeline behind the bread display at the bakery boutique

Jonathan Hermeline assisting his father at the oven.

The bread historian Steve Kaplan reports that in 18th century France, rural "boulangers forains" (fair bakers) snuck into Paris on farmers' markets days. They sold their large countryside loaves, weighing up to twelve pounds, at prices that challenged those of the established city master bakers who had fixed overheads.[1]

The people's demand for bread was high, and the city bakers could not respond to it. Thus, the tradition of the fair bakers earned some respect in the city.

Some of these fair bakers were farmers who grew wheat and who milled it to supply their weekly batches of bread. Other farmers traded flour and baked to earn an extra income.

In 21st century France, the craft of *paysans boulangers* (farmer bakers) is well established and respected. Some critics, including Kaplan, might say that such farmer-bakers will never reach the standards of the "new" French baking trend led by superstar bakers such as Kayser, Vasseur, Poilâne, or Ganachaud, to name a few[2]. To be sure, good bakers of any type, artisan or farmer, are hard to find. But some farmer bakers do live up to the expectations of good bread.

In France today, the prerequisite to opening up a boutique is to become a certified baker by either following a professional training or by acquiring three years of experience under a recognized master baker.

The only other legal way to make and sell bread is to be a farmer-baker, making bread with at least 70% of the ingredients grown on his (rarely her) own land. Farmer-bakers grow and mill their own wheat, tend a boutique shop next to the bakehouse, and deliver to farmers' markets and other food shops one to three times a week. A common assumption among farmer-bakers is that good bread should be baked in a wood-fired oven.

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Thierry had been employed as a baker for over twenty years, and Cécile was a teacher of health sciences when they decided to move to a farm and start baking old-fashioned sourdough bread in a traditional wood-fired oven. In 1999, they landed in the Perche country and bought a ruined farm called La Grande Suardière.

A barn housed an old carved stone oven that stood up against time. Thierry followed training in agriculture and learned the basics of organic wheat farming.

Cécile said: "The first year, we had a superb wheat harvest. We were poor, but we had a lot of wheat!"

They had only two hectares of land.

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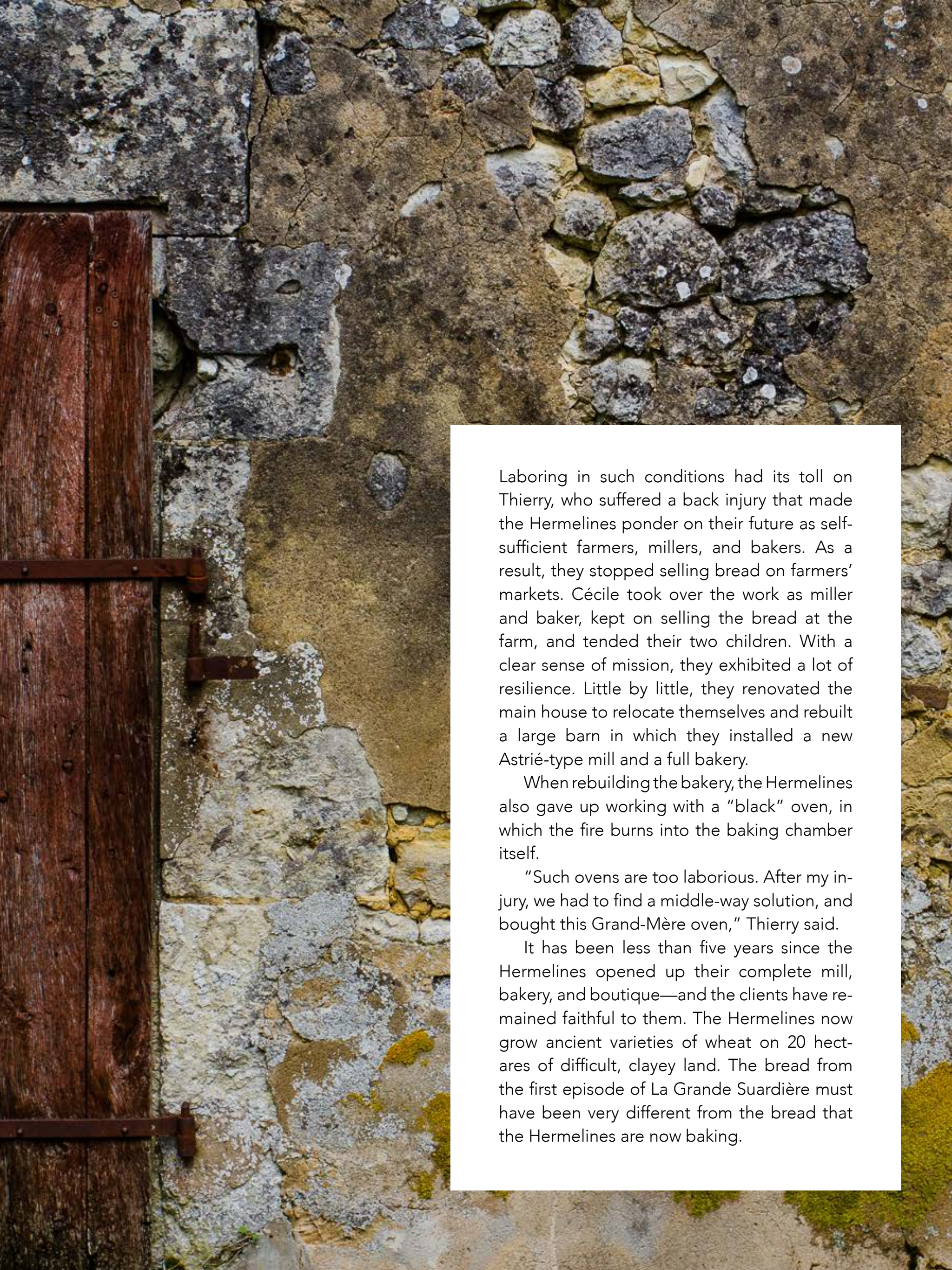
1 Steven L. Kaplan. *The Bakers of Paris and the Bread Question, 1700-1775*. Durham: Duke University Press, 1996.

2 Steven L. Kaplan. *Good Bread Is Back: A Contemporary History of French Bread, the Way It Is Made, and the People Who Make It*. Durham: Duke University Press, 2006.



Laboring in such conditions had its toll on Thierry, who suffered a back injury that made the Hermelines ponder on their future as self-sufficient farmers, millers, and bakers. As a result, they stopped selling bread on farmers' markets. Cécile took over the work as miller and baker, kept on selling the bread at the farm, and tended their two children. With a clear sense of mission, they exhibited a lot of resilience. Little by little, they renovated the main house to relocate themselves and rebuilt a large barn in which they installed a new Astrié-type mill and a full bakery.

When rebuilding the bakery, the Hermelines also gave up working with a "black" oven, in which the fire burns into the baking chamber itself.

"Such ovens are too laborious. After my injury, we had to find a middle-way solution, and bought this Grand-Mère oven," Thierry said.

It has been less than five years since the Hermelines opened up their complete mill, bakery, and boutique—and the clients have remained faithful to them. The Hermelines now grow ancient varieties of wheat on 20 hectares of difficult, clayey land. The bread from the first episode of La Grande Suardière must have been very different from the bread that the Hermelines are now baking.

François scores loaves under Jonathan’s watchful eye.

The Hermelines' bread is a celebration of craftmanship, dedication, hard work, and simplicity. Once a year, at the nearby village of La Perrière (home to 291 inhabitants), hundreds of visitors attend a major Arts Festival.

For two consecutive days, tourists, art aficionados, and holidaymakers—including hordes of Parisians—stroll in the streets and open houses, admiring works of arts of all kinds. The Hermelines' bread has been a cornerstone of this event for years.

Being the only bakers in the area, the Hermelines agreed to supply bread, pizzas, fougasses, and other snacks to the fair's hungry crowd. This meant working for 48 continuous hours to produce more than four times the bakery's daily production of bread. And the Hermelines usually make bread only twice a week (on Thursdays and Sundays)!

To make this happen, the family collected as much help as possible from friends, family, and neighbors. I had been apprenticing at the Hermelines since early spring 2015, and I definitively wanted to be part of the team and make the Hermelines' efforts in teaching me worthwhile.

I wanted to live up to their generosity and train as hard as I could.

During the first six weeks of my apprenticeship, I must have been a burden for Thierry, who, as a rather rigorous and taciturn baker, was expecting me to learn from him by way of imitation. I was privileged, I thought, to get a few words of advice once in a while, which Cécile said she could rarely benefit from.

By observing each of Thierry's quick and precise gestures, listening to his laconic explanations, and by paying attention to every detail, I slowly gained an insight into his methods and techniques. I had to turn off my over-rational mind, which kept on reflecting on the reasons behind it all.

I had to trust my hands.

Thierry's baking shift for the Arts Festival bread production begun at 11 P.M., rather than the usual 2 A.M. The previous days, Thierry had milled wheat continuously, using ancient wheat varieties—including the famous *Rouge de Bordeaux*—grown on the farm's land. He sifted the flour slightly and kept the small and large bran flakes to incorporate into whole wheat doughs.

I had to turn off my over-rational mind, which kept on reflecting on the reasons behind it all. I had to trust my hands.

When I joined Thierry in the bake shop that night, loaves from the first batch were already cooling on racks. Thierry had shaped the second batch and stored it in a large proofing cabinet. Now, he was preparing salted breads (pizzas, fougasses), and sweet breads (rolls, buns, brioches). It was time to heat up the oven again.

I fed the fire in the burning box beneath the oven, and the blazing flame passed through a cast-iron side door (gueulard in French) which could be incrementally opened to direct the flame into the oven. When the oven had heated evenly and sufficiently, I shut the gueulard. Quickly, I brushed the hearth with a broom and cleaned it of any remaining embers and ashes. Then, we let the oven stand for fifteen minutes to let the heat spread more evenly.

Meanwhile, we mixed and kneaded more dough.

Unlike some more purist farmer bakers, Thierry does not knead by hand and relies on an oblique mixer. True to the spirit of old-fashioned ways, but maybe not its letter, he mixes and kneads a liquid levain, freshly-milled flour, and purified water at a very slow speed, and only for a few minutes.

We gave the dough folds at intervals and completed its bulk rise in large buckets. It was highly hydrated and way more extensible than elastic. That is due to the flour's freshness (fresh flour contains thiol compounds that degrade gluten), and to the high gliadin and low glutenin content in old wheat varieties.

Such a dough could not be divided, weighed, and shaped using mechanical equipment. Shaping the loaves by hand was the most challenging of all technical tasks. The hand movements had to be quick, efficient, precise, but gentle. Thanks to Thierry's great patience, I had improved my dexterity at the work bench, and by the time of the Arts Festival, I could

shape nice 1200 g country-style loaves to be proofed in wicker baskets. But I still could not shape larger loaves (2.4 or 4.8 kg), Thierry's chef-d'œuvre.

When the oven was ready and the loaves fully developed, we brought the proofing cabinet next to the oven's door. I loaded bread on a long wooden peel, Thierry scored the loaves and slid them in the oven. Large breads entered first, followed by medium-size and more fragile breads. Finally, small breads went in at the front.

I learned how to gauge the doneness of burning hot loaves by appreciating their crust texture and by paying particular attention to the sides of hearth loaves. Just a few baking minutes could radically alter the final product, in positive or negative ways. As Thierry's first assistant during the Arts Fair production, I handled the oven with confidence, pulling out loaves that had a contrasted palette of colors, from dark brown to golden tones. The crumb

had an irregular honeycombing and filled the air with sweet, butter-like, wheaty fragrances.

The Arts Festival went on for two days. It was laborious, but surprisingly, the atmosphere in the bakery was more relaxed than usual. Thierry had given me a lot of room for initiative and had let me handle important decisions by myself. I pondered that part of Thierry's intuition had slipped into my stream of consciousness. I had been able to develop a "bread mind" for myself.

Thierry seemed to enjoy himself around the company of family, friends, and assistants, in spite of the overwhelming work. He even slipped away from the bakery during production and went to meet visitors. To me, this was a silent testimony to his confidence in my skills.

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For the Hermelines, the farm was never intended to be limited to bread alone. In their view, bread is a means to meet people from all ranks of society, and to teach them about a healthy lifestyle. Cécile's cooking classes, which focus on producing and transforming all sorts of wild and cultured plants, as well as the Hermelines' permacultural vegetable gardening, contribute to a self-sufficient, long-lasting way of living that can inspire others to effect change in their lives.

It is through bread and apprenticing the craft from a dedicated farmer baker that I experienced the most inspiring journey ever. I longed to find a way of living that would help me keep up with the expectations of an academic career. I knew bread was part of the overarching plan but had not realized until my apprenticeship that a true, sustainable lifestyle can only occur through inner transformation.

The Hermelines' commitment, faith, and volition are guiding me along the path.

For more information about Thierry and Cécile's Hermeline's bread and farm, visit:

- The Hermelines' website (in French)
- The Hermelines' page on the Savoir-Faire & Découverte website
- A series of three videos, by RFI Accents d'Europe, on the Hermelines' farming, milling, and baking activities (in French)
- François Thibeault's website, which includes texts and photos about bread and building a wood-fired oven.

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François Thibeault is a traveler, photographer, writer, academic researcher, ... and a baker. He shares his passion for bread, wood-fired ovens, and his admiration for artisan bakers on reporterra.com.

From left to right: Thierry, François, and Cécile

LEARNING ARTISAN BAKING IN BARCELONA

Words and Photos: TIA INGLE

Ever thought of baking in Barcelona? Well, last year I made my pilgrimage to Barcelona precisely because of it, to participate in the first International Course of Artisan Baking, organized by the Gremi de Flequers de Barcelona (Bakers' Guild of Barcelona).

For quite some time, I have been fascinated by Josep Pascual's baking techniques and methods, as well as his philosophy on bread making. When I first met Josep Pascual in 2014, the timing of my trip to Barcelona did unfortunately not align with any of his classes that I could have attended. But we stayed in contact and a year later, he invited me to attend his international course on baking techniques.

The course is the brainchild of Catalan bakers such as Josep Pascual and Toni Valls Grau, the current director of the Gremi Institute, and Jaume Bertran, the director of the Bakers' Guild, all passionate about sharing professional baking techniques with fellow bakers.

Josep Pascual is a member of the Guild and a regular contributor who mentors aspiring bakers. He also participates and judges in international baking championships, and travels around the world holding workshops where he teaches his bread making philosophy.

The course sold out within the week it was announced.

The International Course of Artisan Baking was not a "hands-on" course but a four-day intensive lecture and demo style introduction to a variety of techniques with insight to how different bakers nurture their natural leavens. Josep Pascual had invited several craftsmen from around the world to share their expertise on baking techniques and recipes. The course sold out within the week it was announced—I was happy that I had put my name down immediately!

Having lived and studied in Barcelona, I love the city, so going there was like going to see an old friend.

The Gremi Institute is situated right in the heart of the City of Barcelona on Pau Claris. It's not a student campus, so organizing my accommodation was my own responsibility. I chose to stay in an AirBNB just down the road in Barrio Gotico, an exciting old neighborhood filled with great cafés, restaurants and bars, and places to see in general. I loved walking to the institute every morning, stopping at a café to grab a coffee along with a "Bikini" (a Catalan sandwich) for breakfast before class started.

We were approximately 40 participants on this course. Many were bakers of renown themselves, eager and ready to soak all the baking knowledge on offer. Although it was already September, the mercury was tipping closer to 40°C! However, I think the degree of our excitement for the course was higher than that.

We were all poised with our notebooks and pens, not to mention the smartphones and other devices to record the course as it unfolded. It felt good to be there.

DAY 1: JOSEP PASCUAL AND MICKAËL CHESNOUARD

The first day was kicked off by the maestro himself: Josep Pascual.

He is a charismatic Catalan baker who exudes passion for his baking methods. Josep Pascual's particular expertise and artistry are in his use of stencils and forming intricate shapes out of his breads.

He has also created his particular method of making bread, referred to as *El Método Pascual*: a set of techniques he has devised in the use of natural starters, a procedure in the fermentation of the dough, followed by the shaping and decoration of the bread dough. His butterfly breads are the most Gaudiesque of inspirations. When they emerge from the oven, they appear ready to take flight.

Right from day one I was floating with those butterflies, indulging in their aroma and, above all, gaining greater insight into professional baking concepts and philosophies.

Bread heaven for me!

Key learnings from Josep Pascual:

- To have a successful masa madre (sourdough starter in Spanish), the quality of your flour is paramount, and the content of bran in it is no less important—Josep prefers to use stoneground flour as opposed to steel cut where all the bran content has been removed from the flour. If you don't pay attention to the provenance and quality component of your flour, baking results will be reflected by this.
- To make a good natural leaven, you only need flour and water, if you address the quality of your flour first.
- Water itself isn't so important, providing of course that it is drinkable. Neither is the temperature of the water, as long as it isn't scalding.
- With more starter and less feeding, you can attain a good dough base. Adding too much feeding and not enough starter is more likely to stress the starter dough. In other words, activating your starter with larger quantities of actual starter and less water is more effective.

  Quite often, the amount of starter used in a bread dough is around 12-22 % of the flour weight. Josep favors 33%.
- It is desirable to maintain a stable pH level for a relatively lengthy period.

Pointers such as these were the reason I was there: to gain a better understanding of the use and maintenance of sourdough starters—the area of baking that makes the craft of baking both fascinating and magical!

Not to mention the fantastic shaping techniques displayed by Josep!

Pointers such as these were the reason I was there: to gain a better understanding of the use and maintenance of sourdough starters—the area of baking that makes the craft of baking both fascinating and magical!

Mickaël Chesnouard is an accomplished French master baker and director of Atelier M'Alice of Minoterie Girardeau in Nantes, France. After Josep's introduction into the art of sourdough management and shaping techniques, Mickaël treated us to some fabulous pastry insights. Despite the growing heat of that afternoon, he proceeded to show us how to create croissants to die for.

It was entertaining to watch Mickaël run between the refrigeration room and the baking auditorium in the sweltering heat of that afternoon, trying to keep the dough (and himself too) cool! In between it all, he kept stressing that you should "listen to your dough."

So true, bread making, apart from being such a tactile experience, really is an experience open to all our senses!

Key learnings from Mickaël Chesnouard:

- For croissants to be crispier, the quantity of butter should be less, rather than more.
- The butter content in his recipe is only 10% in proportion to the overall amount of flour before the tempered butter is incorporated into the dough during the lamination process.
- One of the reasons homemade croissants are difficult to make is that we home bakers do not have the luxury of "laminating" machines. Although rolling pins do the trick, it is a lot of elbow grease!
- If your flour is really strong, then mixing it with some plain flour (lower protein content) can help. And again, the quality of your flour is important, if not paramount.
- When laminating the dough with the butter, it is important that the dough and the butter are always evenly spread. You don't want dodgy pockets of dough with no butter content.
- It is also essential that the dough is kept cold at all time. Good croissants are all about good temperature control.
- Overall, an overly strong dough is preferable to a weaker one. If it gets too warm, don't panic. Just place it back in the fridge to cool down.

  It is perfectly OK to form the croissant, then fridge/freeze them, and bake them later. The overall gluten network of the dough needs to be dense and tense, and yes, practice makes perfect!

At the end of this session Mickaël, just like Josep Pascual, placed the key to success on the quality of the raw materials used. His message and philosophy clearly communicate that a baker should always keep in tune with his product by paying close attention to all raw materials and how they interact with each other.

Above all, to me, he is a fabulous pastry wizard to marvel at and I felt so lucky to be there at the learning end of it all.

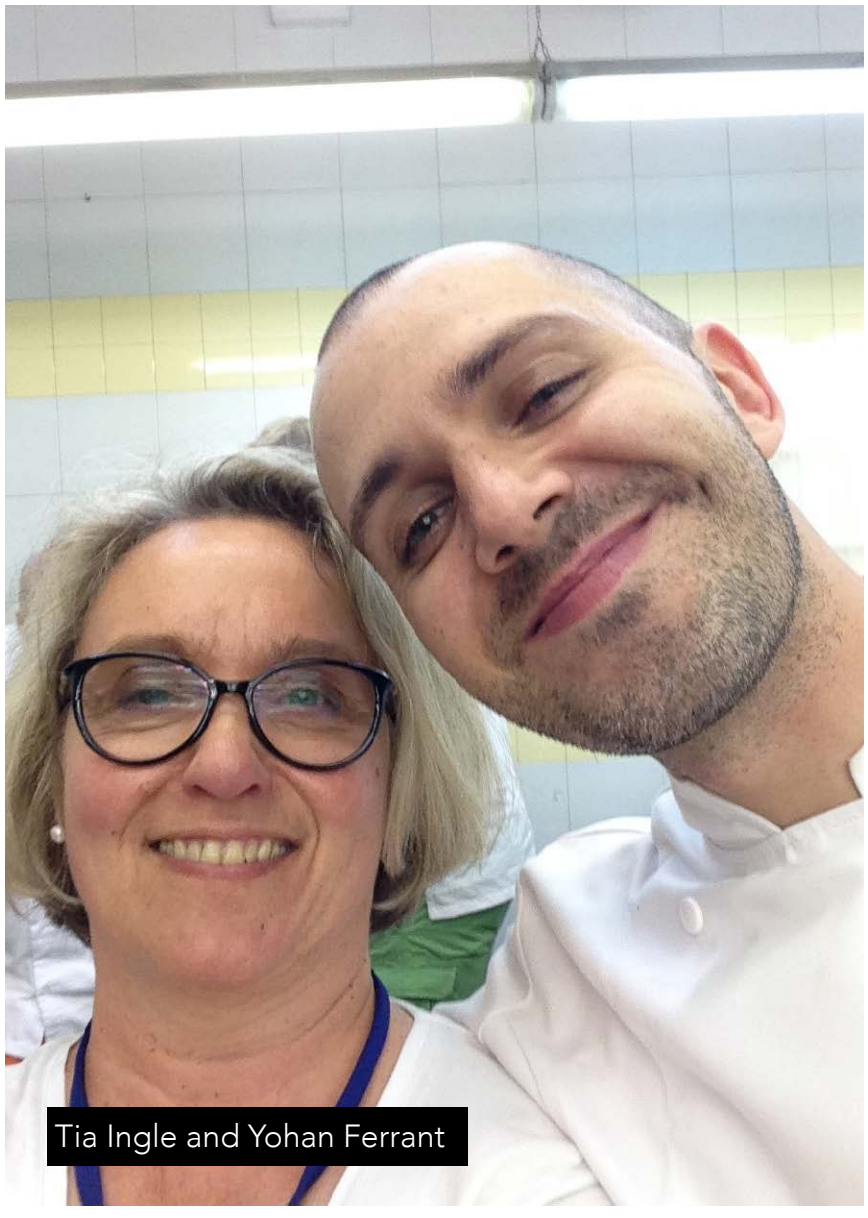
We were well into the evening before the first day came to a close. Although it had been a very long day, I don't think any of us noticed this. We were all keenly anticipating the next day.

A baker should always keep in tune with his product by paying close attention to all raw materials and how they interact with each other.

Toni Vals Grau

Mickaël Chesnouard and Yohan Ferrant

Yohan Ferrant



Tia Ingle and Yohan Ferrant

DAY 2: YOHAN FERRANT AND EZIO MARINATO

Friday, our second day of the course was led by Yohan Ferrant (you can follow him on Instagram). He is a fun loving French baker whose baking journey started when he was a little boy watching bakers bake their bread[1].

Yohan champions the 48-hour baguette, with no commercial yeast. His enthusiasm in the making of these baguettes is infectious.

Yohan's love for natural ingredients is evident in the preparation of his starter which he prefers to make from scratch—a 100% liquid levain. I found it interesting to note how he paid great attention to the pH and acidity levels of his natural starter levain.

It was refreshing to realize that Yohan wasn't overly worried about not having a starter that has been passed on from one generation to the next. With quality ingredients, anyone can make a good starter!

One of the key learnings I got from Yohan's class was the concept of *bassinage*, which is to withhold some of the total hydration and then add it to your dough at a later stage according to need.

By doing so, you have better adjustment control of the dough. It makes good sense because flours are not all equal. Some flours simply do absorb more or less liquid than other flours. By using the bassinage method, it is also easier to produce wetter doughs because you are incorporating water to the dough at different stages according to need.

1 Jeremy Shapiro has a terrific blog post on Yohan on Stir the Pots I recommend you read.

Key learnings from Yohan Ferrant:

- Liquid levains tend to be more acetic.
- A good starter liquid is best made from strained fermented juice (such as raisins).
- The use of organic rye flour will promote better enzyme activation in the starter.
- Systematic feeding is best.
- Once the starter becomes active and has the desired pH level, it benefits from being stabilized in the fridge for around four hours at 4°C.

After Yohan, we were introduced to Ezio Marinato, a fiery Italian baker with a great passion for rustic Italian bread and different treatments of natural leaven—or lievito madre, as he called it.

One real take-home factor of this course started to dawn on me during his class. Something I always had sort of suspected...

One real take-home factor of this course started to dawn on me during his class. Something I always had sort of suspected. It was the confirmation that there are no hard and fast rules on how to create and nurture a natural levain. Every baker during this course shared a different method of preparing a natural leaven starter along with their particular philosophy behind it.

To me, that illustrates the extent of creativity there is in this craft and why I love it so much.

The levels of hydration and flour content used by the master bakers were also totally variable.

Yohan Ferrant favors a highly liquid version of masa madre, Josep Pascual not so liquid. And Ezio Marinato's lievito madre was more like a beautiful ball of mozzarella when he produced it. It was fascinating to experience these different starters: they all share the same concept of fermentation and work very effectively, yet each baker has his own approach for how to maintain them.

Ezio's Italian lievito madre is virtually the opposite of Yohan's liquid levain, as he uses less than 50% hydration when developing and feeding it. He was also really emphatic that you should always feed it with the same flour. Ezio also says that leavens can have very fickle reactions if you change the flour diet they are accustomed to. It is better if you can stick to the same source of flour.

Interestingly, the Italian lievito madre also differs in character in the sense that it is not left to bubble but is placed in water and will be good to go when it floats up to the top. Yet another approach on how to incorporate hydration to the starter! When the leaven is not in use or it has to travel, it is taken out of the water, swathed in thick linen, and tied up to keep it in check.

Key learnings from Ezio:

- Always use the same source of quality organic flour for your natural leaven.
- A just under 50% hydration is desirable during the feeding process.
- Keep note of the water the levain is immersed in, as this is its quality indicator.
- Another quality indicator for the leaven is the crust it may start to form.

Guess what was on the lunch menu that day! Pizza, YUM!

DAY 3: ANTTU AND HENRI RAUTIO

On Saturday, the third day of the course, we met the Finnish baker brothers Anttu and Henri Rautio, who came to Barcelona all the way from Mikkeli, Finland where they run their family business Siiskonen, established by their parents over fifty years ago.

Although rye is quite popular in Spain and France, our duo of baker brothers showed us the Finnish tradition and approach to the grain.

I don't think many of those present had ever experienced Finnish sourdough rye bread, which is very intense both in flavor and consistency. Not to mention *karjalanpiirakka* (Karelian pasties), which I have seldom come across outside Finland—at least not commercially. I could sense an element of awe when the brothers swiftly crimped flat ovals of rye into pasties with a flick of a wrist and a quick pinch between fingers! New techniques for everyone to pay attention to, along with the revelation that rye can be used to make clever little pasties!

I don't think many of those present had ever experienced Finnish sourdough rye bread, which is very intense both in flavor and consistency.

The gluggy consistency of a *saaristolaisleipä* dough, from the archipelago islands of Finland, was also very different to what most bakers there were used to. This bread is kind of a batter baked in a tin to form a loaf of bread.

Then, last but not least, there were the Finnish potato rieska. For lack of better description, sort of potato pita breads.

What was key to me again, and what had become a theme of the course for me, was the way they treated natural starters and the power and differentiation that lies within them. The brothers did not call their natural leaven a starter but a *"seed"* which is cultivated and refreshed on a daily basis at specific intervals to maintain its strength and to be active. The stronger the seed, the more active it is.

What was key to me again, and what had become a theme of the course for me, was the way they treated natural starters and the power and differentiation that lies within them.

The way the Finnish baker brothers get their starter going is a five step process:

1. For the first three days, the seed is cultured with 150g rye flour and 250g water at 28°C.
2. After which 5g of the starter seed is extracted and fed with another 150g of rye flour and 500g water for 12 hours at 28°C.
3. From step 2, 2.5kg of the seed starter is fed with 150g rye flour and 250g water for 14 hours at 28°C.
4. By this stage, 380g of the seed starter from step 3 is fed with 750g rye flour and 1500g of water for 8 hours.
5. By step five the seed is ready to use as a starter to start making bread with the cultured natural leavening agent.

To make a successful sourdough, the proper propagation of the seed starter is very important. Anttu's original example was for industrial quantities, so the quantities above were scaled down for us, and need to be scaled even further for a home baker.

The Rautio brothers had even brought their own rye flour from Finland as with no experience with local flours they felt they had to bring their own.

So true, I have often been perplexed how something elsewhere may not bake the same way as it does at home, although I've used exactly the same measurements and techniques. Usually, this is because—like I mentioned earlier—all flours are not equal.

❊ ❊

By attending this course in Barcelona, I not only gained new and fabulous learnings about making and baking bread but also made great new friends around the baking fraternity.

There is a great sense of camaraderie amongst bakers. As much as they are competitive with their craft, they are all very generous and willing to share and advise on how to improve in this craft. They are all passionate about the quality and provenance of their ingredients.

Keeping this traditional craft alive is so important, and we all believe that a key to healthy bread consumption starts with honest ingredients, which are fresh and devoid of artificial additives and flavorings. Traditional fermentation of bread is better for your digestive system and at the end of the day, it is not quantity but quality we should pay attention to.

—

Tia Ingle is a bread coach and micro baker from South Australia with three kids and a winemaker husband. She is passionate about empowering people who care about their bread to bake it themselves and showing them that it can be done with no fancy equipment and only four ingredients: flour, water, leaven, and salt.

You can learn more about Tia on her Facebook page and blog, Flour-and-Spice.

A LITTLE HISTORY ON GREMI DE FLEQUERS DE BARCELONA (The Bakers' Guild of Barcelona)

The Bakers' Guild of Barcelona is one of the oldest institutions found in the city of Barcelona, with a history dating back to medieval times. It was founded sometime during the 12th Century and was officially recognized by King Pedro of Castille.

It was later in 1474 that King Juan II proclaimed the office of bakers as a recognized occupation in society. Another significant development in the office of bakers toward the end of the 15th Century was that bakers who produced bread for the public were obliged to bake their bread in public market premises and not privately in their homes, thus giving rise to the commercial entity of baking.

The first establishment used by the Gremi was the ancient Convent of Saint Augustin. This was their place of abode until 1714 after which the Guild moved to the neighborhood of Raval. In 1869 the Gremi formed its first free society: Montepio de San Honorato in recognition of their patron saint.

A quarter of a century later, this society became the center of the Guild, the Guild of San Honorato, the most influential professional bakers' corporation.

Today, Gremi de Flequers de Barcelona is located in the heart of the City on Pau Claris. The majority of its members consist of bakers whose families have passed the mantle of this profession from one generation to the next. It has been and still is a formidable influence and presence in the culture and commerce of the City of Barcelona. The Guild comprises of over 1,200 points of sale for artisan bread in Barcelona. The majority of these premises have been passed down the family, and one of the most salient features of all these artisan bakers is their passion to utilize natural ingredients and their commitment to pursue the highest levels of quality in their product.

May they prosper forever.

WHY BREAD?

Words and Illustration: SUZANNE DUNAWAY

Photos: SUZANNE DUNAWAY, CATHERINE CRONIN, MELIZZA, and LUIS NÚÑES

When I lived in Rome, my mornings began with a stop at the local *forno*, the bakery, where I could gather the latest gossip, gaze upon the Caravaggio countenances of my neighbor's children, and flirt wantonly with the handsome bakers, their beautiful faces dusted with flour and looking like medieval actors on a fragrant stage. The six-foot-long *pizza bianca* would first be placed on a wooden paddle, carefully pleated, like a piece of fabric, liberally brushed with olive oil, and then quickly pulled to its full length over the stone floor of the oven. The owner would hack off chunks of *pane caserec-cio* for the housewives' lunches, and children would inevitably be munching on little fresh anise flavored biscotti or pieces of just-baked pizza bianca, a morning favorite of every Italian, young and old.

How different from shopping at the American supermarkets, where the shelves are lined with packaged bread—soft, cottony, and most inedible (except for the whole-grain specialty breads that every now and then make a good piece of toast). For years, we have been known as the country of Wonder Bread, Twinkies, and doughnuts, and so, it isn't surprising that there are national rampages against the presence of some of our junk-food restaurants in countries such as France and Italy. Our culture has never been one to embrace artisan bread.

Not, at least, until now.

In existence for a mere 250 or so years, we Americans have the daunting but exciting task of creating our own food history. And we are fast catching up in the realm of daily bread. We now have marvelous bakers who can hold their own among the world's masters, while ironically the French, after hundreds of years of bread history, lament the loss of their crusty, dense and flavorful baguettes—the backbone of any French meal.

The French baguette is probably the most influential bread in modern American bread-making. Everyone wants to make a baguette like the lovely artisan ones found these days only in small French village bakeries.

But were the country breads of Italy more prevalent here, I am sure they'd be the ones we would emulate more often. It is these breads that I want to eat on a daily basis.

"In existence for a mere 250 or so years, we Americans have the daunting but exciting task of creating our own food history."

To educate a country of people who grew up with sliced, white, tasteless loaves about good bread is a formidable challenge. But when you watch someone bite into your handmade rosemary focaccia or olive *filoncino*, you will, I believe, find a willing convert and student.

Education begins, of course, with children. For heaven's sake, give children a great-tasting bread in their lunch boxes instead of calorie-rich, sugar-filled snacks or sliced commercial bread!

After having done demonstrations in supermarkets or at food fair events to acquaint the public with bread from Buona Forchetta Hand Made Breads, our bakery in Los Angeles, I was struck by one thing that happens over and over again: Mothers with children are open to having their babies taste new flavors.

But it is the children themselves who surprise me the most. They try a piece of focaccia or olive bread and almost always ask for more, proving themselves to be much more adventuresome than many adults! Some will come back to my table time after time (in fact, sometimes I'm not sure their mothers know they are there!), grab a handful of samples when I'm not looking and run.

Daily breads, for me, are those you can eat with all foods or which become the meal itself. A simple, well-baked loaf is far more satisfying to me than all the honey-wheat-berry-walnut-raisin-and-garlic breads in the world—even if I have my favorites with flavors, such as a simple, easy to make focaccia with olive oil, fresh rosemary, and salt, or a lovely rustic loaf to be eaten with cheese, tomatoes, and a glass of good vino!

Having daily bread on the table does not mean meticulous, precise measurements, days and days of ripening starters, esoteric levains, temperature-controlled environments, and closets of equipment—all of which sometimes have their place. A more than memorable loaf may be yours in one and a half hours, start to finish—without much effort.

Of course, you may choose to have a longer rising time or put your dough on hold overnight until you are ready to bake. And yes, you will get a more complex and richer flavor as a result.

But let me say to all cooks who feel intimidated by lengthy processes, complicated instructions, and the seemingly arcane language of the baking world: Plunge in! Have no fear! With the recipe that follows, making your simple daily bread will become as much a part of your day as making the morning coffee is.

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FOCACCIA: BASIC DOUGH FOR LOAVES AND FLATBREADS

Yield: 1 large or 2 small loaves or focacce.

This user-friendly dough is about as basic as you can get. It was the dough that inspired me to start my bakery in Los Angeles, and it's one everyone seems to like and anyone can make, including children.

One morning at the Farmer's Market in Santa Monica, when I was setting up my bread concession, I dropped a *focaccetta* (sandwich sized) in the street. I watched with horror as a pickup truck, Mercedes, and a large van rolled over the just-baked loaf. We could see its shape spring back, resilient and just as fresh as ever, much like the Samsonite luggage which, dropped from 30 stories, bounces back without a scratch!

With this dough, you can make loaves of rustic bread, flatbreads, crispbreads, little rolls (*focaccette*), the French ladder bread, *fougasse* (which used to be known as Picasso's Hand), exotic hamburger buns, breadsticks, and more.

You can also forget it in the refrigerator for a day or so, or leave it to rise a bit too long and it will bounce back with little help. Like a good sailboat in a storm, it is forgiving.

INGREDIENTS

Ingredient	Quantity	Weight	Baker's %
Lukewarm water (85-95°F, 30-35°C)	2 cups	470 g	97%
Active dry yeast	2 teaspoons	6 g	1,25%
Unbleached bread flour	4 cups	480 g	100%
Salt	2-3 tsp	10-15 g	2%
Olive oil	2-3 tsp	10 g	2%
Chopped, fresh rosemary	2 tbsp		
Kosher or sea salt	1 tsp		

METHOD

Measure the water into a large bowl. Sprinkle the yeast over the water and stir until dissolved.

Add 2 cups of the flour and all the salt, and stir briskly until smooth, about 2 minutes.

With a strong wooden spoon or one of those rare mixing spoons with a big hole in the middle, mix in the remaining 2 cups of flour for about 2 minutes more. The dough will be somewhat wet and tacky (sticky), but when it pulls away from the sides of the bowl and forms a loose ball, you'll know you have stirred it sufficiently.

If necessary, stir in an additional 1/4 to 1/2 cup of flour.

Same Day Method

Cover the bowl with plastic wrap and let the dough rise in a warm place until doubled in volume, 30 to 40 minutes. Proceed with the shaping instructions.

Overnight Method

Cover the bowl and refrigerate overnight. The dough will rise in the refrigerator and build flavor from the slower yeast action.

Remove the dough two hours before shaping and let stand, covered, in a warm place. The dough will rise for the second time. Proceed with the shaping instructions. This bread will have more 'corny' flavor because of its rise overnight.

With the dough ready, pick a set of instructions below to make loaves, *focaccia*, or dinner rolls.

Loaves

Preheat the oven to 500°F (260°C). Oil one seasoned non-stick, oven-proof 9-inch (23 cm) skillet or two 5-inch (13 cm) skillets.

Pour the dough into the large pan, or divide it between the smaller pans by loosening the dough with a spatula and then scraping it from the sides of the bowl. Try to keep the dough as inflated as possible.

With the spatula, cut the dough off at the edge of the bowl as it falls into the pan. The shape the dough takes on as it falls into the pan is fine.

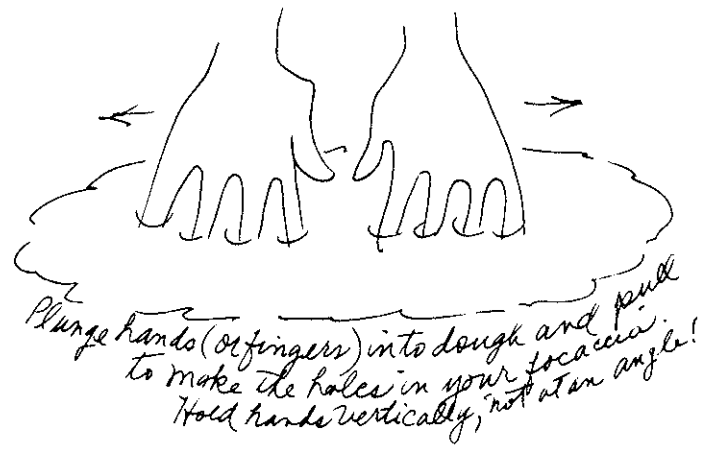
Brush the tops of your loaves with olive oil. Sprinkle them with rosemary and sea salt and set aside to rise until doubled, about 15 to 20 minutes.

Place the bread in the preheated oven and reduce the oven temperature to 400°F (205°C). Bake for 30 to 35 minutes, or until the loaf is nicely browned and sounds hollow when you tap it with your finger. Remove the loaf from the pan and cool on a rack.

Focaccia

Preheat the oven to 500°F (260°C). Oil 1 or 2 non-stick 17x13 inch (43x33 cm) baking sheets.

Pour the dough onto the sheet(s), scraping it from the sides of the bowl with a rubber spatula. Brush the dough with two teaspoons of olive oil.



To make the traditional *focaccia* with indentations, dip your fingers into cold water and insert them straight down into the dough. Make holes in the dough by pulling it to the sides about 1 inch (2.5 cm) at a time. Stretch the holes at random to form little craters all over the pan showing through where you have put your fingers. As you work, stretch the dough into a 1-inch (2.5 cm) thick oval. If you are using just one baking sheet, the *focaccia* will cover almost the entire sheet.

Brush the loaf with another teaspoon of olive oil and sprinkle with the rosemary and sea salt. *Focaccia* does not need to rise, but if you forget it for a few minutes, don't worry. It will bake beautifully despite a little neglect.

Place the baking sheet(s) in the oven and reduce the oven temperature to 450°F (230°C). Bake for 15 to 20 minutes, until the *focaccia* has a beautiful, golden brown color mixed with a little darker brown around the indented area.

Cut *focaccia* into wedges or rectangles and serve warm.

Dinner Rolls:
Making rolls with any dough doesn't get easier than this. Follow the instructions for the *Overnight Method*.

Preheat the oven to 500°F (260°C). Spray a French bread pan with non-stick spray or rub with olive oil. A 3-section pan will yield 9 or 12 rolls, depending on the size of the piece you choose to cut off.

Take a good handful of the chilled dough and gently stretch it out into a rectangle approximately 2 inches wide and 8 inches long (5 x 20 cm). Snip off 2-inch (5 cm) pieces of dough and drop them into the grooves in the pan, using 3 to a groove. You may shape them after cutting if you like, but I prefer the free-form look of the unshaped rolls.

Brush with olive oil and sprinkle with fresh rosemary. Let rise until doubled in volume.

If you wish to make rolls from a room-temperature dough, pour the dough into the grooves of the pan, cutting off the dough with a scraper after a 3-inch piece of dough has fallen into the groove.

Proceed down the groove, letting the dough fall into its roll shape (see illustration). Rolls made this way need only to rise for about 15 minutes before baking. They will have a good spring and be tender with a crisp crust.

Place the pan(s) in the oven and reduce the oven temperature to 450°F (230°C). Bake for 12 to 15 minutes, or until golden brown on top. Cool on a wire rack.

BAKER'S NOTE

For a breakfast *focaccia*, mix one teaspoon cinnamon with one cup coarse brown sugar and sprinkle over focaccia in place of rosemary.

For perfect pizza without paddles or stones (makes two baking sheet size pizzas):

Make the *focaccia* dough, but cut the yeast by half and add 3/4 cup more flour and four tablespoons of extra virgin olive oil to the orig-

inal dough mix. Process the dough in the bowl of a food processor just until the dough pulls away from the sides of the bowl.

The dough should be pliable but NOT sticky and form a nice smooth ball in a few seconds. Add a bit more flour if the dough is not pulling away and forming a ball.

Let the dough rise once in an oiled bowl, covered. Then shape the pizza on an oiled baking sheet, pushing the dough to the edges of the pan with the flat of your hands until you have a very thin pizza base. Cut off the excess with a sharp knife or scissors and use it for the next pizza.

Brush with oil, spread tomato sauce thinly, dot with anchovies and bake for 6 minutes. Remove from the oven and add chopped, fresh buffalo mozzarella and fresh basil. Return the pizza to the oven and bake another five minutes until the edges are nice and brown. This method will give you a good texture without rubbery cheese!

If the bottom of the pizza is not brown enough in your oven, put it on your stove top burners for a few minutes, watching carefully so that it does not burn. This gives a very crisp texture to the pizza.

Store any excess dough in a zip lock bag to use in your next *focaccia* mix or pizza dough.

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Suzanne Dunaway is the author of No Need To Knead and Rome At Home, founder of *Buona Forchetta Hand Made Breads* in LA, illustrator for The New Yorker, Gourmet Magazine, Bon Appetit, The Los Angeles Times and more, and now, dweller in France and Italy where she cooks, writes for Bread Magazine, The American Magazine, and France Today, gardens, and helps her kitty, Loulou, write her blog, Living with Loulou.

I'LL BUY THAT: AFFORDABILITY OF ARTISAN BREAD

Words: DON SADOWSKY

Photos: DAVID HALE SMITH, MARTIN LAINE, DANA FRIEDLANDER, BARNEY MOSS, LEMSIPMATT, and KITTY TERWOLBECK

Those of us who bake bread get so much out of it: beautiful, delicious loaves made to our liking (or to the liking of those we bake for), along with the satisfaction of creating them out of almost elemental ingredients. We also get something else not commonly available to those who do not bake themselves: the ability to choose what our bread is made out of, and how it's made.

We can decide to use the most inexpensive grocery flour available, either because we feel we can make excellent bread with any flour, or because that's what our budget allows. We can bake with whole wheat flour, with ancient or heirloom varieties of wheat, or with rye, millet, amaranth, beer, beetroot or even squid ink. We can mill the grain ourselves, sprout it, crack it, or roast it to a fine flavor.

We can ferment our dough with yeast, adjusting the amount used to balance flavor versus time. Or we can choose to maintain a sourdough culture, manipulating a complex microbial community over hours or days to achieve the desired result.

While equipment and ingredients can be expensive, it's our time, skill and preferences that largely determine the outcome of the baking process.

What about those who want great bread but do not bake? If they have the money and good bakeries nearby, they take what the baker decides to bake. In some parts of the world, even those with little money have access to superb bread made according to ancient traditions.

But for the majority of the bread-buying public—a diminishing group due to the rise (pun intended) of the belief that gluten is unhealthy—bread is a plastic-wrapped, supersonically-fermented affair, considered by breadheads to be devoid of taste and any significant nutrition, difficult to digest, and generally a crime against nature. Bread baked using the infamous Chorleywood process, "adding hard fats, extra yeast and a number of chemicals and then mixing at high speed", is estimated to account for 80% of the bread sold in the UK.

WHY ISN'T MORE BREAD ARTISAN?

There are many reasons for this, not all related to the cost of bread. Wonder Bread in the U.S. was in part a product of the desire of early twentieth century consumers that food be pure and produced using the latest scientific techniques. In its billowy whiteness, without stain or unevenness, Wonder Bread seemed the antithesis of the grubby and supposedly unhealthy past that the modern industrial culture was trying to escape. Nor has that attitude completely disappeared. The Royal Society of Chemistry even today states on its website that in a traditional bakery of the past "the mounds of fermenting dough take up expensive floor space and present hygiene problems. Research efforts were therefore directed to developing a 'no time' dough."

Plus, people eat what they're used to.

Nonetheless, cost can be a barrier to buying good bread. A one-pound grocery store white bread in the U.S. can be had for as little as a dollar. Compare that to sourdough bread made from organic wholegrain wheat and specialty flours, fermented slowly in a small independent bakery, which can cost five times that amount or more. With so many families struggling to pay the rent, it's easy to see how attractive inexpensive bread can be, regardless of what you would rather be eating.

With so many families struggling to pay the rent, it's easy to see how attractive inexpensive bread can be, regardless of what you would rather be eating.

When discussing affordability of artisan bread, it's best not to ignore the rather large elephant in the room. The question of whether your bread is of the best quality pales against that of whether you can get enough to eat at all. According to the U.N., one out of nine people in the world do not. But you can't separate bread from hunger. Bread has often been the chief source of food for those at the lower end of the economic scale.

Bread subsidies have been with us since at least ancient Rome, where perhaps a third of the population received such subsidies in or-

der not to starve. The price of bread has often been controlled, in medieval times, and still in some places today. And sometimes the result has been very low-quality bread, with additives such as chalk, plaster of Paris, clay, and sawdust.

Also, the concern about crafted vs. industrial bread isn't just a first world problem. Where traditional food making traditions disappear in response to urbanization or military strife, the replacements might be the local equivalent of Wonder Bread. So no, wider availability of artisan bread will not cure hunger. But it may make those who can eat it healthier.

A QUESTION OF QUALITY

There is also another, smaller, elephant in this room: it sure would be helpful to agree on what makes an artisan or high-quality bread.

Yeah, I know, it's a quixotic exercise doomed to failure, just like baking seems on those days when you pull a Frisbee out of the oven. To paraphrase U.S. Supreme Court Justice Potter Stewart on pornography, you'll know artisan bread when you see it.

But everyone sees something different. Let me at least offer a few suggestions.

A *sine qua non* in my book is sourdough. While there are amazing breads made with commercial yeast, sourdough breads cause fewer digestive issues, have a lower glycemic index, and are superior nutritionally, all due to the action of the diverse and mutualistic microbial community in the sourdough starter. The term "artisan bread" can rightly be used to discuss both kinds of breads, but the health benefits of sourdough make it a key feature.

Other characteristics that may be found in artisan breads include:

- Some amount of whole grain
- Ancient varieties of wheat (e.g., einkorn and spelt) or heritage varieties; flours from a variety of cereal and non-cereal crops
- Organic ingredients
- Long fermentation (either sourdough or commercial yeast)
- Baked fresh, without parbaking (partial baking)
- No dough enhancers, preservatives, or other ingredients intended to cure the deficiencies of industrial baking

Each of these factors adds to the cost of a loaf of bread. It may be due to space, labor, cost of ingredients, or special handling.

BARRIERS OTHER THAN COST

Not all areas have the same access to heritage varieties of wheat. In New Zealand, for example, growing and marketing heritage varieties are at an early stage. Even in the U.S., where interest has grown considerably over the past decade, availability depends on the part of the country. In Maine and California, local wheat economies are developing, spurred by organizations such as Maine Grains and Community Grains. In Maryland, where I live, there is less access to local heritage grains, because production is more scattered.

Even in the U.S., where interest has grown considerably over the past decade, availability depends on the part of the country.

As heritage varieties become more widely grown, their price will decrease. But price pressure comes not only from the supply side but also from the demand side. It turns out that bakers seeking heritage grains have another set of competitors for grain: brewers. The high price of beer and other alcoholic drinks is driving up the cost of certain specialty grains that brewers and bakers use in common. Ultimately, the alcohol-driven demand for such grain should speed up its mainstreaming into larger-scale agriculture and the economy, benefitting all kinds of consumers. But in the meantime, shortages and price premiums may occur.

Of course, bakers can always get specialty grain shipped from a distance, but that comes at a price. Further, heritage varieties may not have the same milling and baking performance as familiar, commodity varieties of wheat. Bakers and millers may have a learning curve with any new variety. Not to mention the in-

creased variability of the properties of an unfamiliar crop that is grown at low volumes by just a small number of farmers. And sometimes a shipment of a new variety of wheat turns out to be worthless for anything but dusting the bench. All that can add to the cost of a loaf.

At least in theory. In practice, things are pretty complicated, and they depend a lot on where you live.

FOOD DESERTS AND HAVENS

At one end of things (at least where there is enough food at all) are food deserts, low-income areas where residents do not have easy access to a supermarket or other outlets selling healthy food. There are food deserts in both urban and rural areas. Often, the only accessible food is sold at small convenience stores. There, the selection of breads may be limited, with fresh bread making no appearance whatsoever. So, not only does low income make healthy bread difficult to buy, but the infrastructure to deliver and stock such bread may be nonexistent. It takes a lot more than baking and agricultural expertise to make artisan bread generally available in a food desert.

So, not only does low income make healthy bread difficult to buy, but the infrastructure to deliver and stock such bread may be nonexistent.

At the opposite end are affluent neighborhoods in many metropolitan areas where not only more people have more money but a culture has developed which values healthy, less processed food.

Such areas may feature independent bakeries with talented and innovative bakers, restaurants that have developed sources of good bread or bake it themselves, farmers markets, and permanent stationary markets.

ARTISAN BAKERS SPEAK

I was interested in what things look like from the perspective of small artisan bakeries. So, I conducted a highly unscientific survey of self-selected respondents with a small sample size (cross my heart, I promise not to claim any statistical significance).

The bakers ply their trade in Australia, Brazil, Britain, New Zealand, Spain, Ukraine, United Arab Emirates, and the U.S. (note the alphabetical order so that no country need feel slighted). Most have small operations, generally microbakeries. All sell at least some sourdough. Here are a few things that came out of this survey:

1. These bakers did not uniformly charge more than supermarkets for what the supermarkets call "artisan bread" (not all areas had such things in supermarkets). Prices ranged from 60% of the cost of a local supermarket version to approximately 2.5 times the price.

2. The cost at which the bakers sell bread made with specialty flours is not significantly, if at all, different from that for the bread they sell made with more standard flours. Not all the bakers had reasonable access to specialty flours and those that did largely made the decision to spread the costs over all their breads.

3. While most sell their bread to middle-class and wealthier buyers, one reported that working class customers were beginning to buy their bread. Another will cut deals or barter if the price is difficult for a customer to meet.

4. Sourdough fermentation times (ranging from 7 to 65 hours) were not specifically costed out by most of the bakeries. This makes sense, as the bakeries (which may be the home of the baker) were set up with long sourdough fermentation in mind. Those that did report a cost estimated that long fermentation could add between 10% and 50% to the price of a loaf.

5. Artisan bakers who respond to surveys about their business from someone they barely know to help the person write an article are wonderful people, generous with their time. (You all know who you are.)

My main takeaway from this is that those who have access to small, dedicated artisan bakers can buy healthy, well-crafted, and diverse breads for not a lot more than the high end of what is sold at a supermarket.

THE MANY TYPES OF BAKERIES

What about the places where everyone else buys their bread? In the U.S., in-store (i.e. supermarket) bakery sales for 2013 were $13 billion. 2011 data for the entire baking industry were $33 billion, from over 8,000 businesses (and shrinking, compare an estimate from 2003 of over 30,000 U.S. retail bakeries). While these data were from different sources and a slightly different year, and cover all bakery products, they give a general sense that over a third of bakeries' sales are made at supermarkets, with the rest being retail and commercial bakeries.

It's not easy to figure out what kind of bread people are buying at all these different outlets because there are so many business models.

For example:

- The traditional mom and pop bakery (or for me, my grandfather's bakery)
- Small artisan micro bakeries, using the highest quality ingredients, perhaps locally grown and milled, long fermentation times and dedication to craft.
- Huge commercial operations pumping out breads that rise at almost relativistic speeds, where a slice can be compressed to the size of a pea (I did that once), and which have tongue-twister ingredient lists, shipped hundreds of miles for sale.
- Medium-sized bakeries that ship artisan breads to outlets that can sell them while they're still fresh.
- Bakeries making parbaked (partially baked) "artisan" loaves to be finished off in a supermarket and thus claimed to be freshly baked on premises.
- Commercial bakeries making "sourdough" bread, where "sourdough" means that a sour flavor has been added to a standard, mediocre bread.
- Chain restaurants that bake somewhat decent-looking bread on premises according to standard formulas. Generally not sourdough.
- Bakery franchises where the chain buys grain in bulk and ships the grain to the franchisees, who mill it themselves and bake some sourdough.
- Supermarkets (and sometimes health food stores) with a bewildering array of pre-packaged breads, which may include organic or specialty flours, even ones claimed to be sourdough. Generally with long ingredient lists, perhaps novel ingredients to boost fiber.
- Some high-end supermarkets (there is one like this near me) which buy regional grain for some of their bread baked on premises, even sometimes fermented for over a day.

We could debate endlessly over which of these breads should be counted as artisan, how healthy all the different kinds are, whether they taste good, whether people are getting value for their money, and so on.

These issues regarding artisan bread apply to food purchases generally.

WHAT IS AFFORDABLE?

There is one last thing, which perhaps should have been the first thing: *what do we mean by affordable?* Anyone who spends money makes decisions on how to spend it, whether they are constrained by lack of money or have tons of discretionary income to dispose of as they wish. Whether you can "afford" something is a question not only of how much money you have and what your needs are but how much you value that something.

Whether you can "afford" something is a question not only of how much money you have and what your needs are but how much you value that something.

According to 2013 data, the average U.S. family spent $106 per year on bread, while 2009 data showed $457 went to alcoholic beverages. One could say that, based on their spending decisions, people in the U.S. value alcohol more than they do bread! Pancake guru and grains writer Amy Halloran put it well:

"Sure, artisan breads command our imaginations and a good market share in bakeries and supermarkets and at farmers markets.

"But think about the way you think about staples. Don't you want your milk and bread inexpensive so that you can spend money on treats like lattes, cupcakes and craft beers?"

If I can draw any conclusion from this doughy mash, it's that artisan or quality bread is already affordable (strictly as a matter of price) to a much greater proportion of people than those who currently buy it with any regularity.

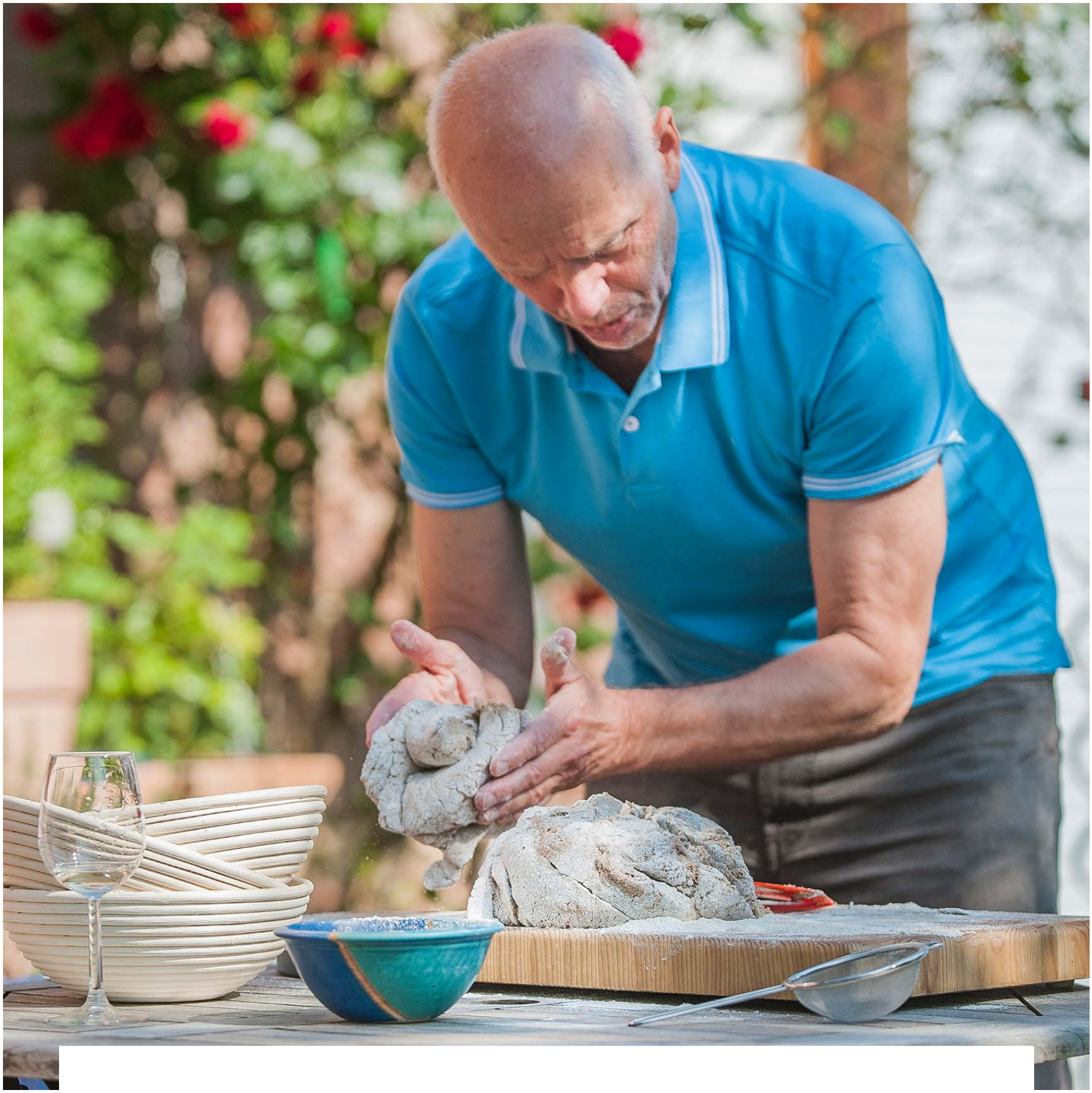
Enough food at all may not be affordable for far too many, and healthy, quality food of any kind may not be affordable and accessible to many others. But for the rest, it's a matter of artisan bread might not being sold nearby, or an acquired taste whose value depends on your food culture and personal experience. Some may be tricked into buying fake artisan bread in groceries, but quality goods have been threatened by cheap (and not so cheap) imitations since long before the term caveat emptor was uttered as a rebuke to those who were too trusting.

You want to argue about any of this? Let's do it over a craft beer or a slow-fermented, organic wholegrain heirloom wheat boule with artisanal cheese.

Your choice.

—

For **Don Sadowsky**, bread is a link in a glorious web of history, practice, science, politics, and craft. Writing is a way to learn, to entertain, to educate and to advocate. Plus it's immensely fun. Connect with Don on Facebook and on Instagram.



THE MAKING OF A MILL MAKER

Words: JARKKO LAINE

Photos: ANDREAS GOINAR and JARKKO LAINE

For Wolfgang Mock, ideas for new mill improvements often come out of the blue, while he's driving his car or lying in bed. In those moments, he quickly records the idea and moves on.

"I think the idea over before I go to sleep. If it's a good one, I get up and start to draw. But if I feel that the idea won't work, I simply fall asleep." Wolfgang says.

But coming up with ideas is not a problem for Wolfgang Mock. He has plenty.

In a five by five meter room attached to the test kitchen at his company in Otzberg, Wolfgang puts his ideas to the test. Together with his collaborator of 20 years, Thomas Mohr, he experiments with mixers and millstones, looking for ways to make a mill more efficient and affordable, while producing even better flour.

"I'm like Steve Jobs," he says, with a playful smile on his face, and continues to explain that he never takes "no", or "I don't think that will work" as an answer.

More often than not, he is right—and he has the track record to prove it.

Since building his first mill in the 1970s, the mill maker has started two of the best-known mill companies in Europe, HaWo's and KoMo, and designed mills for many others. After selling mills mostly in specialty and organic stores, in his third company, he is going after the larger public with Mockmill, a stone mill attachment for stand mixers with a Hobart attachment hub, such as KitchenAid or Electrolux.

So, if you've tried a European-made home mill, you might very well have used one of Wolfgang Mock's designs.

"I think 70% of all the mills sold in Europe are mills I designed." he says, "Even Schnitzer, a company older than ours, asked us at KoMo five years ago to produce mills for them."

I met Wolfgang in his home, a century-old German Hof in the village of Otzberg-Lengfeld near Frankfurt.

The building that once was a farm (with livestock, a slaughterhouse, and even a distillery) now hosts a small community of families and like-minded people. Paul Lebeau, Wolfgang's neighbor and partner in his current company, describes the concept as a "holistic, humanistic but thoroughly modern lifestyle" with more pianos than TV sets, where people are free to share as much or as little of their lives as they like. Everyone in the Hof has his or her privacy, but when someone sits down at the long wooden table in the shade of a large chestnut tree Wolfgang and his wife Elfriede planted when they bought the place, others are invited to join.

Children from one-year-olds to early teens share the yard, and at night, it's not uncommon to find your son or daughter arranging a sleepover at a neighbor's home. In the morning, if your curtains are up or your keys are hanging in the lock outside your front door, you might hear a knock from a friend wishing to borrow a few eggs or use your oat roller.

If your curtains are up or your keys are hanging in the lock outside your front door, you might hear a knock from a friend wishing to borrow a few eggs or use your oat roller.

The Hof, which the Mocks have been building for the past 35 years, is for them a project of a lifetime—and also a part of the reason for the couple's focus on the mill making business.

But to get there, we first need to go back to the seventies.

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One of the common themes I notice when I talk to craft bakers is that many of them didn't start their professional lives with a career in bread making in mind. I have listened to former engineers, teachers, and people from many other professions tell me how at some point in life they realized that bread making was the thing for them.

Just like them, Wolfgang Mock, too, didn't start out planning to become a mill designer. You could say flour and milling found him, rather than the other way round.

When this happened, Wolfgang was a young psychologist working at an institute for early childhood autism he had helped found, developing methods to help parents better communicate with their autistic children.

Wolfgang was a young psychologist working at an institute for early childhood autism he had helped found.

"For my birthday in '75, *last century*, a good friend of mine brought me as a gift a loaf of bread he had baked himself," Wolfgang says.

"I ate this bread, and I thought: Wow, this is good! I asked him, 'How did you do it?'"

The friend had a mill—a big, heavy, hand-cranked one bolted to a bench. Wolfgang had seen the value of nutrition in his work and was eager to learn more about the benefits of freshly milled flour and baking his own bread.

"I went to him, once a week, to fill a big box with freshly ground flour. At the time I didn't know anything about just-in-time milling, so it seemed good enough," he says.

Since then, Wolfgang has been making bread. At the Hof, he invited me to bake bread with him, Paul, and Pablo Puluke Giet, an enthusiastic young baker who is teaching the mill maker some new tricks and helping him develop a wholegrain-based bread-making course for the company.

As we mixed our doughs, Wolfgang told me how he always used to tell people how bread making was all about taking care of the bacteria in the dough as well as in the gut.

"The dough is not resting. It's our friends, the bacteria, doing their work," he said when we covered our doughs for their first rest.

One day, the friend with the mill told Wolfgang that he and his wife were leaving on a nine-month bike tour all the way to Cap Verde in Africa and asked if Wolfgang wanted to borrow the mill while they were gone.

"I used the mill every day. It was hard work," he says. "The next Christmas, when they were still in Africa, we decided to make Christmas cake, the very famous Nürnberger Stollen. I worked at the mill for five hours!"

Wolfgang was already captivated by milling, so when the friends came back from Africa ("They really came back!" he exclaims, laughing), it was time for him to buy a mill. Looking for relief from the hard work of cranking, he decided to go with an electric one and chose a French Samap mill.

"It was like a little tower made of cardboard. Two stones rotating at 3000 times per minute—it's a very fast one—but the main thing was that the air they used to cool the motor, the hot air, was also used to blow out the flour into a capture vessel.

"After a while, I said, 'Wow, this isn't a good mill. It's like first cutting an apple into pieces and then using a hairdryer to make them brown.' Hot air, lots of oxygen.

"So I started to think about my own mill."

Wolfgang brought up the idea to an old friend, Harald, who thought it sounded like an exciting project. And so, the two got to work. Meeting on weekends and learning as they went, the duo slowly built a stone mill with a wooden enclosure to suit their milling needs.

"One and a half years later, we had our first mill. My oldest daughter said, 'You could call it HaWo,' based on our names," Wolfgang says.

For Harald, making one good mill was enough—he wanted to be a university professor—but Wolfgang felt like making more of them. So, he founded his first mill company, HaWo's, and went to work on his own, with Elfriede's support.

Wolfgang continued improving the mill, sourcing components from companies all over Germany, and the two assembled them in their small living room in Darmstadt while maintaining their day jobs. Elfriede worked as a special education teacher, and Wolfgang as a psychologist, also teaching seminars on intercultural communication for the German Foundation for Developing Countries[1].

"I always remember the best day we had, Elfriede and I. We started early in the morning, at 6, and finished at 10 P.M. We had built thirteen mills! Because we wanted to go on holiday the next day," Wolfgang says, with Elfriede nodding in agreement.

"We made the mills, and then I wrote a letter to maybe 120 organic foods shops," Wolfgang says. "'Hey, we've developed a mill for you, and we have a nice price. The mill costs X to make. Let's divide the difference between X and the price you will sell it by two. Half for you, half for us.' I knew nothing about business."

But it wasn't just the business that was new to Wolfgang. He was also breaking new trails in the world of mill making.

1 Unlike the other teachers, he finished his seminar days by teaching participants how to make sourdough bread!

As we sit at his kitchen table over coffee with a mixture of milk and cream, and some of Elfriede's cake, I ask Wolfgang how he knew what to do and where to start.

He again shows me his whimsical smile—at another point in the discussion, he tells me that the older he gets, the crazier he becomes. The man wears a combination of humility and ambition, self-deprecating humor and confidence that makes him irresistible. Wolfgang is the kind of man who can be serious one minute, focused on milling the right amount of flour for his bread course and start making music by opening and closing the mills' covers the next.

He takes a deep breath and tells me, "I do not know. We just did it."

Then, after giving the question a little more thought, he continues, "I always have the ideas, and look for people who work better with their hands than I do."

Wolfgang is the kind of man who can be serious one minute, focused on milling the right amount of flour for his bread course and start making music by opening and closing the mills' covers the next.

For a one-man company making mills in the living room of a small third-floor apartment in Darmstadt, finding suppliers wasn't always easy. Like when Wolfgang was looking for a motor supplier for his mills.

He sent letters to seven companies, asking for an offer for 1,000 motors per year, and one by one, representatives from the companies visited him to discuss the details.

The men in suits sat at the edges of their seats, stiff, glancing at the Ché Guevara and Bob Dylan posters on the walls of the Mocks' living room.

"Maybe they were afraid we'd glue them to the chair!" Wolfgang says, laughing.

Out of the seven companies that all promised to make an offer, only one did. And so, with that company, Wolfgang went to work on the motor.

"We had a long discussion with him because he didn't believe in our technique," Wolfgang says. "Because we moved the motor shaft up and down. If the shaft goes up and down, and

there's the stone at the end of the shaft, and above the motor, you have a wheel to turn a little bit, then the shaft is the only moving part."

"The more moving parts, the more parts that can break," he says enthusiastically and goes on to explain the details of the invention that became an important part of not only the first mill but many of his later ones as well.

Unfortunately, the first batch of motors were faulty, and the shaft wouldn't move. And as it often goes, Wolfgang only noticed this after he and Elfriede had carried the motors up to the third floor!

Hands bleeding (the motors had sharp edges), they brought the whole batch back down and returned them to the producer for some fixing and fine tuning. With the next batch, the idea worked.

Just not in time for the party that Wolfgang and Elfriede had planned to celebrate the first mills, inviting the people involved in making them as well as many friends. So, because of the problems with the motors as well as some mistakes the carpenter had made in drilling the hole through which the grains fall on the millstones, they had a party but no mills!

"But we had a nice party. It was very nice." Wolfgang says.

And some weeks later, when the motors and woodwork had been redone, production on the first HaWo's mills could begin.

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A few years later, in the early 1980s, Wolfgang and Elfriede spotted a notice in the local newspaper about an old farmhouse for sale in Otzberg, not far from Darmstadt where they were living at the time. The notice didn't even include an address but sounded promising: an old farm with a lot of room and a big yard—lots of space to renovate and convert into apartments for a community of friends they envisioned.

Intrigued, the couple drove to the village, peeking into courtyards to see which of them was the one for sale. When they finally found the right place, there was no going back. In 1982, after lengthy negotiations with banks afraid to loan money to a young couple with no savings, to buy an old house badly in need of renovation, they moved in.

"For a while, I built mills in the main house," Wolfgang recalls. "Then we converted the dairy barn into a workspace and moved there."

Creating the community they had in mind when they bought the farmhouse was a lot harder than the Mocks had expected. It took some false starts and many years of refining the idea before the right people had moved in and the group as a whole had found a way of life that worked for them—a perfect balance of individuality and community.

"It was only about twelve years ago that the dream started to become reality," Wolfgang tells me, and I can't help but admire the perseverance in believing in the dream during all the years of uncertainty.

Luckily the mill business took off faster, and soon, the mills were selling in the thousands. Wolfgang found himself in a position where he needed to decide what to do with his career. While his work with autistic children was rewarding, Wolfgang also found it tiring. He realized he enjoyed mill making and the act of creating he found in it even more.

"It was a job where I could develop something," he says. "The best time for me is when we're creating a product, right up until it's ready. Then it starts to be boring."

He made his decision and then, as a first step, went from his full-time job to being a freelancer—with the same patient group, just not so many of them. And then, as the mill business grew, he gave up first his work as a psychologist, and later, the communication seminars.

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At the heart of a flour mill is the millstone—a technology that is thousands of years old but which still, perhaps surprisingly, has the potential for further development.

When Wolfgang and Harald started designing their mill, one of the first things they did was to go looking for millstones. They found a company that made stones for big gristmills and agreed to produce the small stones for the HaWo mill.

It was an efficient stone pair that could grind 500 grams of grains a minute, much more than made sense with the small motor in Wolfgang's mill (or a home mill in general). So, underpowered, the mill got stuck and stopped almost immediately. Once again, Wolfgang found himself faced with an interesting problem in need of solving: how to prevent too many kernels from entering the mill at once?

The first solution was a wooden screw to limit the flow of grain to the stone. It worked, but Wolfgang wasn't happy yet.

"I told Harald: that's not a good idea. We need a stone that will not pick up more than 100g a minute," he says. "So we talked to our supplier and told him that we needed to change the stones. And he did it."

The new shape worked, limiting the flow of grains without the need for any extra moving parts—a common theme in Wolfgang's mill design philosophy.

But there was another problem: the stone material wasn't strong enough. When there were tiny stones in a bag of grains, as sometimes happens, they could break pieces off the millstone, which would end up in the flour.

"It didn't matter for the bigger mills because they were used by farmers to feed their cattle. But when people started calling me and saying, 'I have a problem with my teeth,' I knew it was time to change that," Wolfgang says.

A friend told Wolfgang about the use in medical equipment of a ceramic compound for bonding *corundum*, an extremely hard mineral. Sensing that this material would solve the issue with his milllstones, he went looking for a company that could use it to produce such stones for them.

"We found an abrasives company in Austria and told them we need a corundum stone bound with the ceramic material. They developed one for us. I went there to assist in the development, I think, three to five times, and finally, the stones we got worked well. Three to four years later, the competitors did the same." he says, telling me that still today, ceramic-corundum millstones are standard for small-scale stone mills.

Many years later, when developing his current product, *Mockmill*, Wolfgang was again faced with a challenge involving the millstones.

"The first time we tested a prototype stand mixer attachment with stones was 10-11 years ago," he says. "It didn't work because we used the flat stones we were used to. The motor simply stopped."

That was because the KitchenAid motor, which isn't all that powerful, simply didn't have the power required to rotate the stones as they worked flush against one another. The solution came from an unexpected place:

"Years later, we developed at KoMo a hand mill that was supposed to be used by small children in Kindergartens," Wolfgang recalls.

"So we considered the stones: how can we develop a millstone that requires less power?"

In the end, they managed to create a new shape that required only 30% of the power needed by the original flat stones. Then, Wolfgang remembered the mill attachment he'd been working on years earlier and asked Thomas to try the new stones in it.

"Just as we saw with our very first stones, when the mill produced 500 grams and then stopped, there was an overload problem: we had to change the surface and the structure of the stone. We did that, and it worked. We made the stone so that the machine could work," he says.

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Listening to Wolfgang tell his story, one thing that becomes clear is that when he decided to take on the adventure of mill-making—even if he didn't know it back then—he didn't choose the easy path. Well-respected in his field, he could have had a much less turbulent career as a psychologist and educator. But he doesn't complain. Maybe that's not what he was after, in the end.

As anyone who has ever run a business will know, choosing the right business partner is crucial—and it isn't easy. Wolfgang had to learn this the hard way when, in the mid-1990s, after trying to bring HaWo's to the next level, he was forced to give up his share of the company and start over.

But thanks to his ideas for a new and improved mill, and strong support from the German organic stores, he didn't take long to return to the market.

From 1980 to 1987, Wolfgang had spent a lot of time to develop a German-wide organization for shop owners, distributors, and producers—"a lobby organization for natural food" as he describes it. He had also used his experience in communication to teach shop owners how to better communicate with customers.

"I used all I learned in teaching the people headed for the developing world. I put together a 7-part series of seminars, looked for people to present them, and taught them how." Wolfgang says.

Now, in 1995, as he was starting again with a new mill and tight finances (without the money for tooling, Wolfgang tells me, he had to push his imagination to create a perfectly fitting wooden thread for the mill's hopper) he found that the work he had put in back in the eighties, without asking for anything in return, proved its worth.

"In response to my queries, former customers said, 'We've always sold mills from Wolfgang, and we will still do that now.'" he recalls.

"Who knows mills, knows Wolfgang Mock"

Wolfgang was impressed by the response, and so, when he launched his new company, Wolfgang Mock GmbH, and his new mill, Fidibus, that thought became a slogan: "Who knows mills, knows Wolfgang Mock."

As he tells me this, Wolfgang points to his kitchen wall where the poster sits, framed, next to his grain dispenser—and a Fidibus mill.

Even though the Fidibus was originally sold under the Wolfgang Mock brand, most of us know it today as a KoMo product.

Soon after leaving HaWo's and going on his own, Wolfgang got a call from Peter Koidl, who had been the HaWo's distributor in Austria before the changes in the early 1990s.

"I was free of HaWo's, so I told Peter, 'Sure, we can work together again now.'" Wolfgang says.

The two felt comfortable working together, and about five years later, they founded KoMo as a sales company for the products Wolfgang was developing and building.

"On that middle table there, we produced every day between 80 and 100 mills. Thomas and another guy. We made it so easy to produce mills that it took about 5-6 minutes to assemble one." he recalls.

Everything was going well for KoMo, and Wolfgang Mock GmbH had been practically put to sleep.

Then things got complicated again.

Thanks to the new millstone, the KitchenAid attachment developed a decade earlier was finally working, and driven by a hope to reach a larger audience, Wolfgang wanted to bring it to the market.

"Three million people buy a KitchenAid every year, and if we get maybe one percent of them, that's 30 thousand a year!"

"Three million people buy a KitchenAid every year, and if we get maybe one percent of them, that's 30 thousand a year!" he told his business partner.

But there was a significant initial investment in tooling involved, and the partner wasn't ready to take the risk. Wolfgang, on the other hand, felt he had to follow where his instincts were leading him.

"I told him: You don't want to do it, you're satisfied with things as they are. Let's talk about that. That was in November 2014." he says.

In the end, Wolfgang sold his 50% share of the company and hurried back to the Darmstadt authorities to reanimate the business that he had been preparing to close down.

"That was it, but in between, it was a lot of fun," he says.

From left to right: Paul Lebeau and Wolfgang Mock

Wolfgang is approaching seventy, but he isn't done with starting new projects and going after new ideas. His answer to my wife when she commended him on having started so many things in his life is revealing.

He hopes to start many more!

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Today, Wolfgang is as passionate about home milling as ever. Paul Lebeau joined his company as managing director at the beginning of 2016, and together, the two are taking the business to a new level.

But what is it that drives them?

At this stage in life, the goal mostly isn't monetary. The two men want to create a business that they can be proud of and that can enable them to work near their families. They want to build a product they believe in.

"35 years ago, I told people I want to see a mill in every household, every kitchen," Wolfgang says. "That's still the dream. Still the idea."

Paraphrasing Michael Pollan's statement from his book Cooked, he tells me: "When we invented white sugar, it was a big sin. But when we started to make white flour with roller mills, we went beyond any reasonable borders for our health.

"That's what he wrote, and that's what I also believe. It was the biggest mistake ever."

"I always tell everyone at every trade show that I don't care if you buy a mill with another brand. The main thing is you buy a mill, or use a mill. I will be very happy if they buy our mill. But if you don't like our mill, the main thing is to grind fresh. Because, when they ask me what the difference is between this or that mill, I say, it depends on you: What shape do you like, how much money do you want to spend?"

"But why is it important for everyone to mill fresh flour?" I ask Wolfgang.

"I would say they don't need a mill if they buy old lettuce, if they give old flowers as gifts, if they cut up apples and eat them two weeks later, and if they pour a beer and drink it after six weeks. Then they don't need a mill. But at the same time, they want their beer fresh, they want their lettuce fresh, they bring fresh flowers.

"They should do the same with grains because all the aroma, all the necessary nutrients, as we now know, are in the germ and the bran. And in the roller mills, those valuable parts are removed and sold to the animal feed industry. And what you have left over is just this white flour."

Now, with Mockmill, Wolfgang believes he can help bring the idea of freshly milled, 100% extraction, whole-grain flour to the general public.

"We were always working in this small organic foods 'village'. Some percent of the German people buy in an organic store. It's only a small group. We wanted to go into the big wide world to bring this just-in-time milling to more people." he says.

"All the aroma, all the necessary nutrients as we now know, are in the germ and the bran. And in the roller mills, those valuable parts are removed and sold to the animal feed industry. And what you have left over is just this white flour."


Mockmill
MOCK

To succeed in this market, mill makers have to rethink their products and the way they build and sell them.

"The dream would be to produce a mill that costs no more than 150 Euros and is better than the wooden mills, produces better flour. That's the dream. That would be a mill for everybody." Wolfgang says.

While he believes it will still take a long time, "maybe 20 years," before we see a mill in every kitchen, using the stand mixer motors already found in millions of homes to power a stone mill is a smart step on the way.

"We're appealing to the thousands of enthusiasts mastering artisanal baking to consider including just-in-time milling in their set of capabilities and skills. Those of them who have invested in KitchenAid, Kenmore, Electrolux and AEG mixers can start right away with Mockmill."

And the dream, it's more than just talk.

In addition to an abundance of Elfriede's artistic creations, the Mocks' home is filled products designed by Wolfgang—"I only use mills I've designed myself", he tells me—from mills to grain dispensers to oat rollers.

The strongest proof, however, came on Sunday morning, when at breakfast, Wolfgang's nine-year-old granddaughter stood up, measured 300 grams of whole grains and ground them into flour for her pancake batter!

That natural gesture seemed, to me, the perfect example of how a life built around fresh grains can not only be good for us but also help people—including children—appreciate the simple joys of doing things themselves!

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For more information about Wolfgang Mock, his company, and the Mockmill stone mill attachment, visit the company's website and Facebook page.

A BAKER'S FAVORITE BREAD: JEREMICHE

Words: JARKKO LAINE

Photos: TWO COFFEE BEANS

In our series, *"A Baker's Favorite Bread"*, I ask bakers two questions: First, "Tell us a bit about yourself and your bread making." And second, "What is your favorite bread, and why?"

In this issue, we meet Jeremy Zanni, a self-taught French baker living in Galway, Ireland. I first found out about Jeremy and his bakery, *Jeremiche* from this beautiful video—make sure to watch it!

You can also follow Jeremy on Facebook and Twitter.

Here's what Jeremy told us about his baking and his favorite bread, and a recipe.

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"I juggle my hours according to life, not the opposite, and I believe it makes an awful lot of difference on your sanity."

***Jarkko**: Can you tell us about your bakery?*

Jeremy: My so-called bakery is simply a Portakabin in the front yard, with a great view of our 300+ years old Thatched Cottage, out in the sticks of the western Irish countryside.

I've been baking for the last seven or eight years, slowly but surely because I am self-taught. I started by selling bread to a few ex-colleagues, then moved on to a market stall, and now mainly to restaurants and direct orders.

I still think "bakery" is a big word for what I do: I just bake bread part-time, supplying two restaurants and two coffee shop in Galway City.

The main reason for baking part-time and starting at 3 AM is the quality of life. Working like a donkey 9 to 5 Monday to Friday ain't for me. I juggle my hours according to life, not the opposite, and I believe it makes an awful lot of difference on your sanity.

I'm a proud member of a group called Real Bread Ireland, whose aim is to promote and encourage people to get back to baking and eating Real Bread, through talks, courses, and general education.

***Jarkko**: Can you share a favorite bread of yours? Why do you like this bread?*

Jeremy: My all time favorite has to be a freshly baked *ficelle*.

Ficelle is made with the same dough as the baguettes but shaped so finely that it's almost only crust (150 g dough for a 40 cm long bread). A fresh cup of coffee, a Ficelle halved lengthways and buttered, and a nice piece of cheese = the perfect breakfast!

And as we talk about it, we might as well share the recipe. So, here is my recipe for the baguette dough.

THE RECIPE: *BAGUETTE OR MICHE DOUGH*

All ingredients should be weighed, not measured.

Ingredients

Ingredient	Quantity	Baker's %
Strong white flour	500 g	100%
Lukewarm water	350 g	70%
Dried yeast	5 g	1%
Sea salt	11 g	2.2%

Instructions

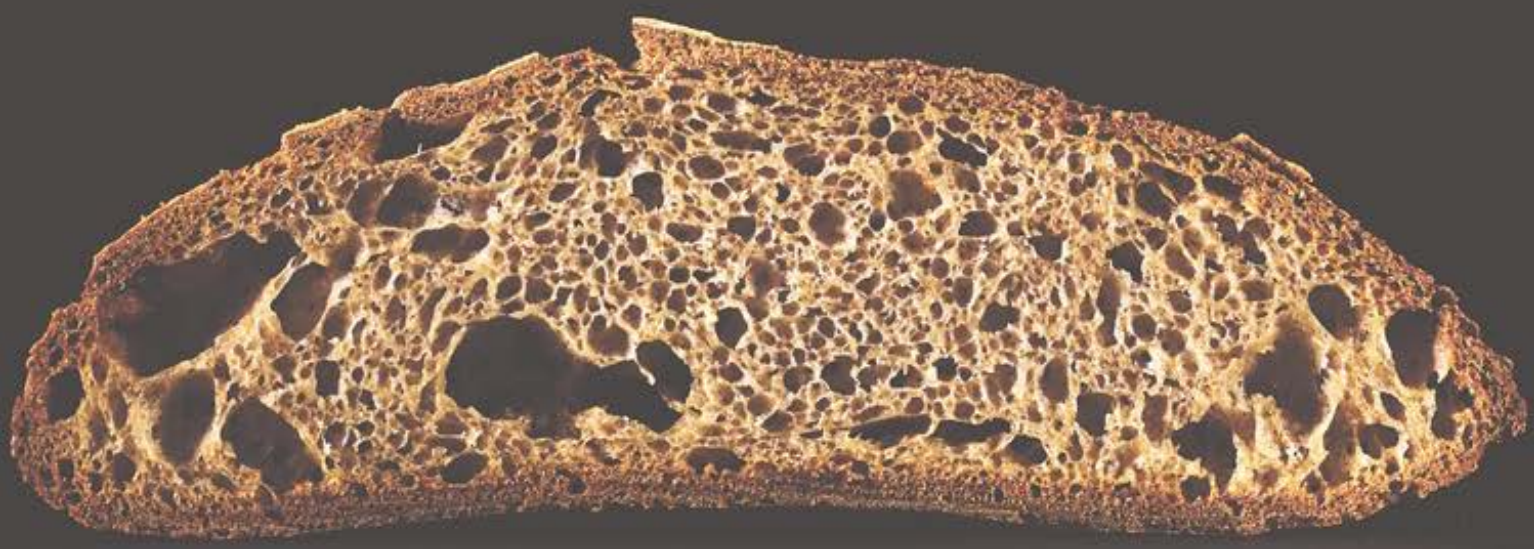
1. Weigh the yeast, followed by water, in your mixing bowl.
2. Weigh your salt in a separate cup.
3. Stir in the yeast with a fork, then add your flour to the mixing bowl.
4. Gently mix the ingredients together until the dough doesn't stick to the container anymore.
5. Add the salt and mix again until you feel that it has dissolved.
6. Place the dough on a non-floured worktop and start working it using the "fork" technique until it is elastic and doesn't stick to your hands and worktop anymore.
7. Sprinkle a bit of flour on the worktop, and gently shape your dough into a ball.
8. Place the dough in the mixing bowl covered with a cloth. Leave it to ferment overnight, or 8 hours for baguettes and ficelle—and up to 48 hours for miches to give them better texture and flavor.
9. Place your dough on the worktop again and divide it into two or four pieces.
10. Shape the pieces into balls and leave them to rest for 5 minutes.
11. Shape the pieces into baguettes or miches. Then let them rise for an hour until they have doubled in size, on a cloth covered by another one, making sure to keep the baguettes well spaced. Meanwhile, don't forget to preheat your oven to 250°C (482°F).
12. Place your baguettes on a floured baking tray, making sure to space them well. Score each baguette with a sharp knife or razor blade, and cook for about 18-20 minutes, or until golden brown.
13. Leave the baguettes to cool on a wire rack, then enjoy.

Note: Bake the baguettes only for 12 minutes, cool them down and they are part-baked, ideal for freezing.

WELL DONE FROM THE START

Words: MICHAEL SELLERS

Photos: THOMAS SCHAUER, BUYANAL SADIQ, and BIEN CUIT



Chef Zachary Golper—author of the acclaimed cookbook, Bien Cuit, and owner and chef of an equally popular bakery by the same name—is a man on a mission, with a vision that goes far beyond his hip Brooklyn neighborhood.

"My focus right now is on the sustainable sourcing of food," he says with visible passion.

"For me, it's all about regenerative agriculture—not just organic, but farming that involves significant carbon sequestration, and that starts with the soil and how it's tilled and maintained."

Golper smiles and admits that several years ago he wouldn't have guessed he would be among those leading the charge for regenerative farming.

"We were fighting just to stay open from week to week," he says as he points to a bench by the bakery's expansive front windows.

"That's where I used to sleep. We did everything ourselves. So I'm very proud of the team that my wife and I have assembled who have helped us to achieve a certain level of success."

Golper is being modest.

Not only is his cookbook a hit, but his retail and wholesale operations feed thousands of people across the metropolitan New York area every day. In 2016, he was nominated by the James Beard Foundation as an Outstanding Baker. But perhaps most importantly, he patiently answers every question put to him about his famous mahogany-colored loaves (the French phrase, *"bien cuit"*, roughly translates to "well done" in English).

"We were fortunate to end up in this particular neighborhood," Golper says about Boerum Hill, a gentrified portion of 'brownstone Brooklyn' that is a mere 15-minute subway ride from lower Manhattan.

"There are generations of Europeans living nearby who immediately appreciated our philosophy of a cold and lengthy fermentation, followed by a long bake resulting in a dark, chewy crust," he recalls.

It also turned out that several influential food writers and bloggers lived near the bakery, which led to a write-up in The New York Times shortly after he opened. It hasn't slowed down since.

Golper's fascination with bread and pastry began at the age of 19 when he apprenticed with the resident bread baker at an organic farm and meditation center in Oregon.

"That's where I learned about the benefits of cold fermentation," he says. "We didn't have refrigerators, but we had cold Oregon nights in a former sheep barn that had been converted to a bakery. It completely changed the way I thought about bread."

"We didn't have refrigerators, but we had cold Oregon nights in a former sheep barn that had been converted to a bakery. It completely changed the way I thought about bread."

He still employs the long and cold fermentation method—he is famous for his three-day miche—but has also begun to look beyond the day-to-day operations of the bakery to appreciating the role he may play in supporting regenerative agriculture in the United States.

"By focusing on where we source our grains from, we are making an enormous statement with our purchasing dollars about what we believe in, and making sure that the farmers who are practicing regenerative agriculture make money to keep their operations going."

While Golper had always had an interest in maintaining a connection with farmers and millers, it was a trip to Kansas last September that changed the way he looked at the production of commodity flour.

"I was touring this mill, and the place was enormous, taking up what would be a city block here in New York," he says.

His tour guide was the owner of nearby micro-bakery, and he was using her kitchen to do some test baking with perennial grains grown in nearby Salina.

"As I'm staring up at these huge silos, my friend tells me that this particular mill produces 60% of the flour that is sold in U.S. grocery stores. That's when I realized that the same flour—nearly a million pounds a day—was being used to fill retail bags for many different popular brands. Sure, there were slightly different blends depending on the brand, but it was all coming from the same wheat, grown with the same chemicals, and I found it a little disturbing. As bakers and consumers, we had lost our connection to those who grew and milled the grain."

Golper is passionate about working with farmers who are making the transition to organic agriculture, especially those who employ methods that yield significant carbon sequestration, literally pulling carbon from the atmosphere and putting it back into the soil.

"This is more than organic," he says excitedly. "Most organic farmers are tilling to control weeds—a mechanical process that takes the place of chemicals. When they till the ground, those blades go down into the soil and cut the root system of the plants and they die off. What most people don't realize, however, is that there is also fungus—think mushrooms—under the soil that lives among the plant roots. When you till the weeds, you break up that fungal network."

"By focusing on where we source our grains from, we are making an enormous statement with our purchasing dollars about what we believe in."

Golper leans forward in his chair to explain. "Say you've got an excess of phosphorous in this area of soil, and an excess of nitrogen over in that area. Plants are able to use the network of underground fungi to communicate and transfer nutrients. Tilling rips the fungal network apart, disrupting communication among the plants. So what you require is a different method of tilling that involves rolling and crimping."

What he's describing is a device that rolls across the field and mashes the plant stalk down, but leaves the roots intact. At the same time, little needles built into the roller deposit seeds for the next round of planting.

So while the crimped plant begins to die, the next plant is sprouting in its place.

"You're covering the needs of the soil as far as maintaining nutrients, but you're also creating biomass in the root system to enhance the soil. This method ensures constant photosynthesis [converting carbon dioxide into oxygen]. It's an extremely responsible and sustainable method of farming."

Golper says that his close attention to climate change is due, in part, to the birth of his daughter. He worries about the legacy being left to her and future generations.

"The trip to Kansas showed me that being disconnected from the source of our food is dangerous," he says. "So I have begun sourcing my grain from farms that practice this type of crop management—some in New York, others in southern Canada and New England. I learn whatever I can about the farmer—his or her methods—so I can match my values to their style of agriculture."

He admits that it's not always easy.

"We're accustomed to cheap commodity flour, and organic farming is inherently more expensive, which is why some farmers are reluctant to make the switch to organic."

But Golper may have found a solution to that problem.

"It's economically risky for a farmer to make the switch to organic. It can take several years to transition away from chemicals. This transition stage is when the farmers are most vulnerable," he says.

To alleviate some of that anxiety, and to encourage more farmers to go organic, Golper has been buying transitional flour in bulk at organic flour prices.

"The more we bake with it, the more common transitional flour will become. This results in higher demand, which encourages farmers to make the switch. It's a win for everyone involved."

When it comes to the subject of milling his own grain in the bakery, Golper is reticent.

"I'll grind small batches if I'm testing a new type of grain," he remarks, "and while I appreciate maximizing the nutritional qualities that you get from fresh milling, I also have come to learn that milling is an art in itself. Look at the generations of millers who have devoted their lives to perfecting their craft to produce an exceptional final product."

When asked about the current trend for some bakeries to purchase stone grinding mills and take on the miller's job in-house, he smiles. "I feel like... If you hate sleep, if you don't eat, and if you don't have a family, or you don't like going to the movies, or never go to the bar, or out to eat—whatever your thing is. If you hate that stuff, then definitely become a miller/baker. For me, I'm going to leave it to the experts."

Perhaps the reason why Golper is so tuned into the various roles people play is the path he took while learning how to be a professional baker.

"I'm all about progressive behavior, about taking action," he says. "During my career, I was very selective about who I worked with, and I worked with some of the best in the world. It's because of those people that I'm able to be good at this craft. No matter what anyone tells you, it's not all instinct. A lot of it is education."

His advice to those starting out? Be humble.

"I worked at this one place in France, and when I walked in, no one said a word to me. They made sure my attire was correct, but they gave me no instruction. So I picked up a sponge, and I started cleaning. I started doing dishes and wiping down all those areas that the staff wasn't already cleaning. I kept my mouth shut. After a period of time, the staff came to appreciate having me around. Pretty soon the chef was willing to show me some technique, but only after I had finished washing every dish in the place. It was hard work, but it was also awesome."

He recalls, "I remember when it was time to make chocolates for Easter, and I worked a 16-hour day with the chef so that he wouldn't have to work an 18-hour day. Staying behind him, cleaning up, making sure his equipment was ready to go. Anything I could do to be of help."

These days Golper is busy spreading the word about sustainable agriculture, often visiting local schools to talk to students about the concept of responsibly sourcing food. But he also realizes the role he plays as a baker in a high-profile market.

"I'm very proud to be part of an industry that affects such a huge amount of agriculture and such a large population," he says. "It's really an honor to have the responsibility of feeding thousands of people every day, and I take that honor very seriously."

"I look forward to a bright future of responsible sourcing and really high-quality food production. And an occasional day off. That would be nice, too."

—

Michael Sellers is the owner of Journeyman, a micro-bakery in Peekskill, NY that crafts artisan bread for sale by subscription. He became a baker after a long career in health care marketing.

"It's really an honor to have the responsibility of feeding thousands of people every day, and I take that honor very seriously."

EXPLORING THE GLUTEN SENSITIVITY EPIDEMIC

– Notes From a Wheat Intolerant Bread Lover

Words and Photos:
BARBARA 'ELISI' CARACCIOLO

Can I recall the first time someone told me she could not eat bread because wheat made her sick?

As hard as I try, I have no recollection of any episode of "sorry I can't eat gluten" from my childhood. No memory from my twenties either (and it wasn't THAT long ago). I can't remember hearing "gluten makes me sick" or "bread makes my stomach swollen and big as a balloon" until relatively recent times.

Roughly ten years ago and seemingly out of nowhere, everyone started talking about gluten. How gluten and wheat (and bread) were bad for our health, and how avoiding them made them feel better. At the same time, ranks of carbohydrate-free enthusiasts were also multiplying, carbohydrate-avoiders surprising us with their herculean efforts to never use wheat again. Like when using twelve eggs in a savory "bread" recipe to simulate leavening.

All this was happening just as the artisan food renaissance celebrated the virtues of handmade sourdough bread. What was going on? And where did I stand?

I have always been a foodie and bread was—is—my favorite food. So I didn't hesitate for one second. I was (and still am) with the bread and wheat lovers.

But right when I started to feed myself mostly with whole grains and bread, the unexpected happened. I began experiencing severe reactions to food containing wheat or related cereals (such as barley, rye, spelt). Fermenting some of the wheat with sourdough helped, but only to a certain point.

The fact that I had problems tolerating even organic and sourdough fermented bread fueled my curiosity. It pushed my search for answers—and solutions. In this article, I will summarize some of the pieces of a complicated puzzle I hope we will complete soon.

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WHAT IS GLUTEN SENSITIVITY?

Celiac disease is an autoimmune disorder that can occur in genetically predisposed people where the ingestion of gluten leads to damage in the small intestine.

Gluten sensitivity (often called non-celiac gluten sensitivity, NCGS) is a condition with symptoms similar to those of celiac disease that improve when gluten is eliminated from the diet. Individuals diagnosed with gluten sensitivity do not experience the small intestine damage or develop the tissue transglutaminase (tTG) antibodies found in celiac disease (Celiac Disease Foundation).

According to this definition, one may think that a person who shows negative results to the screening test for celiac disease will never develop celiac disease. Wrong. Celiac disease can develop at any time in one's life, and screening tests may change from negative to positive. Yet, celiac disease is quite uncommon, present in about 1% of the population, but considerably higher prevalence rates have been reported for Scandinavian countries, Ireland, and even Western Sahara.[1,2]

Although full-blown celiac disease is still rare, prevalence is on the rise. A study on 3,511 subjects with matched serological samples from 1974 and 1989 showed a twofold increase in the proportion of individuals who tested positive at the screening tests for celiac disease.[3] Similar findings have been reported by other investigations, including a nationally representative Finnish study of 8000 and 8028 subjects with serological samples from 1978-80 and 2000-01 which showed the same twofold increase in objectively assessed prevalence over time.[4] The authors of this Finnish investigation conclude that the increase cannot be attributed to the better detection rate and that environmental factors are responsible

for the increasing prevalence of the disorder.[4]

The prevalence of gluten sensitivity was as high as 6% according to a tertiary care center report.[5] No biomarker is available, but half of the patients test positive for IgG anti-gliadin antibodies, which disappear quickly on gluten-free diets.[6] In a recent crossover trial of subjects with suspected NCGS, the severity of symptoms increased significantly during one week of intake of small amounts of gluten, compared with placebo.[7] A double-blind, crossover trial strategy is currently recommended to confirm the diagnosis.

Also in non-celiac gluten sensitivity, a loss of immune homeostasis accompanied by the activation of innate/adaptive immunity is suspected.

Celiac disease and non-celiac gluten sensitivity share in fact an enhanced innate immune response. Gluten and its related peptides are the triggers, breaking immunological tolerance by inducing the innate immune response and stimulating dendritic cells, which results in leukocyte infiltration and inflammation of gut mucosa.[8]

But bacteria in the small intestine, where bacteria should be few, are not the only ones triggering zonulin. Another compound that can trigger zonulin is gluten.

WHO ARE THE GLUTEN SENSITIVE?

Genes

About 90% of those who develop celiac disease present with one or both of two genetic variations of the HLA genes (the DQ2 and/or DQ8 haplotype). However, these are only susceptibility genes, and other genes plus environmental factors are needed for these genes to lead to celiac disease. In fact, 30-40% of us carry these susceptibility genes, yet only a minimal part of us will develop the full-blown pathology.[9]

According to Fasano's group that has intensively studied the mechanisms underlying celiac disease and gluten sensitivity, people with the DQ2 and/or the DQ8 haplotype may produce too much of a protein which causes the opening of the gut walls. This protein is called zonulin and is an analogue of a toxin involved in something as deadly as cholera.[10]

Zonulin is an inflammatory protein that normally helps regulate leakiness in the gut by opening and closing the spaces between cells in the lining of the digestive tract. It is triggered by harmful bacteria and offers valuable protection to the body, inducing a reaction which helps to flush the bacteria out.

But bacteria in the small intestine, where bacteria should be few, are not the only ones triggering zonulin. Another compound that can trigger zonulin is gluten.

This happens to us all, as Fasano's group has shown. Only, in a healthy gut, the doors momentarily opened by gluten close again right away. And nothing much happens. In celiac disease, these doors stay open way too long and gluten, as well as other compounds, pass the barrier. This leads to severe gut leakage and tissue alterations.

In people with non-celiac gluten sensitivity, we would probably observe something in between.

A recent study compared people with active celiac disease, celiac disease in remission (due to the exclusion of gluten from the diet), non-celiac gluten sensitivity, and no celiac disease and no gluten sensitivity.[11] Groups were compared regarding permeability of the intestine's tissue to gliadin (the most immunogenic part of gluten). With permeability, it is meant how much the intestinal tissue opens up after the ingestion of molecules which trigger the opening of the small intestine walls, like gluten (but not only).

As expected, the non-celiac gluten sensitive group had the worst permeability scores after the active celiac disease group. The celiac disease group in remission (on a gluten-free diet) scored lower than the non-celiac gluten sensitive group, and the results of the celiac patients in remission closely resembled those of people with no celiac disease and no gluten sensitivity. This also confirms that increased permeability occurs in everyone after exposure to gliadin.[11]

Sex and age matter

Women are more likely than men to be gluten sensitive. The ratio of women to men is in fact between 2 to 1 and 3 to 1 for celiac disease and it can be as high as 6 to 1 for non-celiac gluten sensitivity.[8,12,13]

You might think that this happens because women are more attentive to their symptoms. But the truth is that some genetic loci are gender-influenced, and immunoregulation is subject to hormones,[13] which can explain these differences. In fact, autoimmune diseases are more common in women than men. Women have in fact an increased immune activity that provides a survival advantage in the face of pathogenic insult but can also enhance susceptibility to autoimmunity.[14]

While the disease can develop at any age, infancy and middle age (fourth life decade for women, fifth for men) are the most at risk periods for the onset of celiac disease,[13] but newly detected cases are commonly found in the elderly.[15] For non-celiac gluten sensitivity, early middle age (fourth life decade) is the most common age for the first onset.[16]

WHAT OTHER WHEAT COMPONENTS CAN CONTRIBUTE TO GLUTEN SENSITIVITY?

Some people with suspected gluten sensitivity react to the complex carbohydrates contained in wheat rather than to gluten. Many, however, react to both wheat gluten and wheat carbohydrates. It has also been hypothesized a role of proteins other than gluten as possible triggers of the reaction to wheat. It has thus been suggested to talk in terms of *wheat intolerance* rather than gluten sensitivity.

Fructans

Most plants store starch or sucrose as reserve carbohydrates but about 15% of all flowering plant species store fructans, linear and branched polymers of fructose. Wheat and related cereals are rich in, mostly branched, fructose polymers that can be problematic for us humans.[17]

Wheat and related cereals are rich in, mostly branched, fructose polymers that that can be problematic for us humans.

Some modern farming practices may result in increased content of fructans in harvested wheat. It is striking that, for most cereals, fructan concentrations are notably higher in immature kernels than in mature ones. In other words, the fructan content is at its peak before wheat is mature and successively decreases.[18] Harvesting too early or drying wheat before the kernels are ripe may thus result in an increased fructans content.

To note, fructans are not evenly distributed in the wheat kernel, and they have a higher concentration in the bran.[18]

Another aspect which can influence fructans' content in harvested wheat is the plant resistance to drought and cold. Rather than impacting on the overall concentration of fructans, resistance to drought and cold may be associated to the type of fructans accumulated in the kernels. Fructans are in fact known to largely vary in structure.[18]

Some people can develop problems in digesting fructans, fructose, and other fermentable short-chain carbohydrates. In such cases, the colonic microflora feasts on the malabsorbed sugars, generating symptoms similar to those observed in gluten sensitivity.

While the reasons for fructans/fructose malabsorption are still not well known, it is generally acknowledged that diet is an important factor. It is possible that a link exists between this condition and an excessive consumption of industrial foods high in fructose/fructans. Moreover, inulin (a fructan extracted from plants) has become ubiquitous in processed food, including gluten-free breads.[19]

Fructose malabsorption and gluten sensitivity can co-occur in the same individual, and most gluten sensitive individuals do feel better on a low FODMAPs diet (short for Fermentable, Oligo-, Di- and Mono-saccharides and Polyols, used to describe a group of fermentable short-chain carbohydrates).[20]

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Another factor that can make starches less digestible is, quite surprisingly, wheat bran.

The beneficial effects of sourdough fermentation on the degradation of wheat proteins have been described in detail in the literature, and it is known that the lack of proper fermentation during bread making can increase wheat toxicity in predisposed subjects. What is worth noticing here is that fermentation also plays a crucial role in reducing the fructans' content of the baked loaf.[19]

Resistant Starches

Wheat also uses complex polysaccharides made out of glucose to store energy, i.e., starches. Starch consists of two types of molecules: amylose and amylopectin. Starches are insoluble and need specific enzymes to be digested efficiently.

The elective enzyme for starch digestion is alpha-amylase, but the digestive tract can also contain other amylases produced by bacteria. Wheat and related cereals can contain types of alpha-amylase trypsin inhibitors (ATIs) that can block the enzymes from digesting starch and glycogen in the grain.[19]

Another factor that can make starches less digestible is, quite surprisingly, wheat bran. Wheat bran can influence where the starches are digested.[21] The more wheat bran is assumed with the starches, the more distal (far away) the locus of digestion will be, and the longer the time needed to digest the starch. In a healthy digestive system, this can be good because slower digestion also means a slower release of glucose into the blood stream. In less than top notch digestive systems, however, excess fiber can lead to over-fermentation of partially undigested starches.

The way the wheat products are handled before ingestion can also impact starches' digestibility. A phenomenon called starch retrogradation has been described in detail in the literature. To put it simply, the less fresh wheat products are, the more indigestible their wheat starches become. Frozen and/or parbaked bread (just like refrigerated or frozen cooked pasta) are higher in resistant starches content than freshly baked bread (or freshly cooked pasta).

Like wheat bran, these resistant starches are generally considered health promoting agents, because they resist digestion, i.e. contain fewer calories. However, an excess of resistant starches, just like an excess of fibers, may affect a sensitive stomach, reducing the absorption of nutrients and promoting inflammation.[22]

ATIs

These proteins are present in wheat and related cereals and tend to segregate with gluten during processing of the seeds. More specifically, ATIs tend to co-fractionate with gliadin, which means that they can be administered to subjects together with gluten even in clinical trials. ATIs represent 2%–4% of total wheat protein and are present at even higher percentages in commercial gluten.[23]

In recent years, it has been found that ATIs can be as immunogenic as gluten in predisposed subjects. ATIs are in fact strong direct activators of innate immune responses and elicit release of proinflammatory cytokines in cells from celiac and nonceliac patients.[24] It has been suggested that ATIs may contribute to the development of celiac disease and to its worsening and that they could be a key factor also in non celiac gluten sensitivity.[23,24]

ATIs are the plant's way to defend itself against being eaten, and are the primary resistance molecules of cereals to keep away pests and parasites such as the meal bug.[24] Therefore, the more resistant wheat is to pests, the more aggressive the ATIs. And the more immunogenic wheat may become.

Pest resistance is a trait that has been and still is favored by modern plant geneticists[25] and breeding of high yielding and highly pest-resistant wheat has been suggested to play a role in the current gluten sensitivity epidemic.[23,24]

WHAT FACTORS OTHER THAN WHEAT CAN TRIGGER WHEAT INTOLERANCE?

Several "non-wheat" factors can also promote a reaction to wheat and/or gluten.

Altered gut microbiota

The human gut is home to trillions of microorganisms, many of which have specialized in helping us digest foods that we otherwise couldn't digest.

This is the case also with wheat and related cereals. Since we began using wheat as a staple food, our gut microbiota has evolved to support this diet. Specific strains of bacteria hosted in our gut have specialized in degrading the big polymers of molecules of ingested gluten and starches into smaller peptides and glucose units. A lot like what happens in a bread dough fermented with sourdough.

Since we began using wheat as a staple food, our gut microbiota has evolved to support this diet.

In cases of alteration of the gut microbiota, like dysbiosis, this cooperative system between hosted microorganisms and host gets disrupted. Food items that we had no problems digesting earlier—because of a highly adapted gut microbiota—become toxic. Undigested food in the large intestine may result in over fermentation and overgrowth of bacteria also in the small intestine (which is not supposed to host a large number of bacteria). This can lead to SIBO (Small Intestine Bacteria Overgrowth), a common condition in cases of fructose malabsorption and wheat intolerance. It often co-occurs with celiac disease.[26] It is also increasingly evident that the gut microbiota impacts on the brain (gut-brain axis).[27]

Several environmental factors can impair our gut microbiota, altering its "performance" in the necessary digestive role it has evolved to play during our host-bacteria evolution.

One of these factors is the use of antibiotics. Gut flora is severely altered after antibiotic treatment, and these changes can be long lasting. Diet is also an important factor.

Additives

A recently published review article states that "changes in intestinal tight junction permeability associated with industrial food additives explain the rising incidence of autoimmune disease."[28] An impressive number of additives in food have indeed been found associated to some of the gut alterations largely responsible for both celiac and non-celiac gluten sensitivity as well as for inflammatory bowel disease (IBD), a related digestive system condition.

The list includes glucose, salt, emulsifiers, organic solvents, added gluten, microbial transglutaminase, and nanoparticles. The repeated and combined ingestion of these additives can induces mechanisms similar to those found in celiac disease. As the authors put it, "all the aforementioned additives increase intestinal permeability by breaching the integrity of tight junction paracellular transfer, resulting in entry of foreign immunogenic antigens and activation of the autoimmune cascade."[28]

A portion of non-celiac gluten sensitive people may thus be having reactions to gluten because of the mechanisms described above. This may help explain how not all people with non-celiac gluten sensitivity carry the celiac disease susceptibility genes but still experience celiac disease-like symptoms.

Without going too much into details, here are some data on the primary incriminated food additives in the aforementioned review article.[28]

- **Glucose**. Is known as an absorption enhancer. Most glucose absorption occurs through intestinal tight junctions. High intake of glucose can, thus, increase junctional permeability.
- **Salt**. The salt content of processed food can be more than 100 times greater than that in similar homemade meals. It has been recently shown that an excess uptake of salt can affect the innate immune system and, through a rather complicated chain of intercellular exchanges, salt can enhance intestinal permeability.
- **Emulsifiers and surfactants**. Additives such as sucrose monoester fatty acids, major surfactants used in food industry, can compromise the integrity of the intestinal epithelium and increase tight junctions permeability.

  These effects have been observed even at a concentration of 50 mg/L which, as the review's authors notice, is shocking considering that these classes of additives are allowed at concentrations up to 120 mg/L in infant milk formula.

  One important further contribution to this growing body of evidence: a study published last year in the influential scientific journal Nature highlighted severe changes in gut microbiota and gut inflammation in mice exposed to the emulsifiers carboxymethylcellulose and polysorbate-80, at doses way below those admitted in human food.[29]
- **Nanoparticles**. The food industry is also increasingly using different types of nanoparticles to achieve different desired endpoints.

  Several of the nanoparticles used have been found to enhance intestinal tight junctions permeability. Therefore, this technological class of food additives does raise concerns

This list surely does not cover all the substances which can promote gut permeability in food. Several other additives and also natural food items, such as the saponins-rich soy beans and quinoa,[30] could have a role in increased gut permeability in predisposed subjects and thus deserve further investigation.

A weakened digestive system is an easy target for harmful bacteria, yeasts, viruses, and parasitic infections.

Parasites

A weakened digestive system, with less efficient and unbalanced gut flora, is an easy target for harmful bacteria, yeasts, viruses, and parasitic infections. Infections can both start the autoimmune cascade or worsen it.

Several parasites have been found associated with celiac disease, non-celiac gluten sensitivity, and irritable bowel syndrome. Among the most common parasites that can trigger or worsen digestive symptoms, we find giardia lamblia, toxoplasma gondii, and blastocystis hominis.[31-34]

Although we generally do not think we may be at risk of being colonized by parasites, especially not if living in our sterile urban dwellings, these parasites are common and currently on the rise (due to global warming and human traveling).

HAS WHEAT CHANGED?

This is the one question over which heated debate can quickly arise.

It is easy to accept that the way we process food has changed and that some of these changes have caused health problems. What's much harder to think is that our primary staple food, wheat, may have changed, too. To answer, I will ask you to pose yourself another question: in all honesty, can you think of any food that hasn't changed in the last hundred years or so?

The entire history of wheat is a history of change and human manipulation. We humans have favored wheat, a cross-breed of similar grasses, ever since it appeared. A preference most likely driven by its leavening power. Of all grasses (cereals), wheat is the only one that can give us a fully risen loaf of bread. Common wheat (*triticum aestivum*) is in fact also called bread wheat.

Bread wheat is the latest development of previous wheat "relatives" (such as emmer, durum, and einkorn), native to the Mediterranean region and southwest Asia, and it is reasonable to believe that it first appeared sometime between 2000 and 3000 years ago. Farmers have kept selecting and crossing wheat plants ever since, preserving favorite traits. But the changes they could induce were on the macroscopic rather than microscopic level. Most were likely spontaneous and subsequently selected, and they were happening at a rather slow pace.

Things changed at about the turn of last century. Although Mendel's genetic laws had already been around for some decades, it was only at the beginning of the 20th century that botanists started to apply them to agriculture and wheat.[35] This effort was pushed (and financed) by a growing "American empire of wheat" which had been flooding the European market with cheaper and stronger (higher in gluten) wheat varieties since the second half of the 19th century.[36]

Although Mendel's genetic laws had already been around for some decades, it was only at the beginning of the 20th century that botanists started to apply them to agriculture and wheat.

By the beginning of last century, the level of wheat hybridization had reached microscopic precision. And already in 1944 H. E. Jacob, a brilliant wheat historian and independent scholar, expressed concerns about the heavy wheat breeding of the past few decades:

"For six thousand years, climate had relegated wheat to the subtropical or temperate zones. Farther North it froze; farther toward the Equator it burned. This was the law. But if this law was something eternal, why was wheat grown in Canada after 1900 and a few decades later in Siberia? Why did it not freeze?

A new type of man had appeared upon the scene, who would not let it freeze. It was a type that had not existed a hundred years before… This type was somewhat similar to the men who were formerly called 'botanists.' Now, overnight, this type acquired enormous practical importance. The Empire of Wheat, which had enriched the engineers and impoverished many small farmers, also created the grain experimenter, the breeder of wheat, who combined botany, mathematics, and the laws of heredity with astonishing results."[36]

"The Empire of Wheat, which had enriched the engineers and impoverished many small farmers, also created the grain experimenter, the breeder of wheat, who combined botany, mathematics, and the laws of heredity with astonishing results."

Three-quarters of a century after these heartfelt words, when opening volume two of the authoritative World Wheat Book,[37] I find chapters and chapters full of in-depth talk about specific genetic loci for wheat traits useful in particular weather conditions and against specific pests. A very fine tuning towards optimal harvest in any condition and in spite of all environmental threats.

I understand the viewpoint of the agronomist, whose goal is to create the healthiest (as for the plant's well-being), most resistant, and least demanding wheat year after year. The aim is to produce a plant that will need no care and will be so resistant to pests that it won't even need pesticides.

But would such a plant, organically grown but highly genetically modified, be a healthy choice for us? Would the healthiest (for the plant), most resistant, wheat crop also be the healthiest foodstuff for us humans?

I am not so sure about that.

If the only concern for agronomists is plant health rather than human health,[25] it is likely that more toxic hybrids of wheat have been created throughout the years.

Because of similar considerations and also with the aim of preserving biodiversity, some farmers have started to grow seeds that have not undergone the massive breeding of the last century. Studies comparing these old varieties to the new ones have been surprisingly few, but they do seem to confirm a lower toxicity "on average" in old varieties.[38-40] Most heritage varieties are more digestible than more modern ones, with some exceptions.

Considering that some modern varieties can also have a low immunogenic profile, it would be wise to start labeling flour and wheat products with information about the wheat variety. This is also the concluding remark of wheat researcher and historian Åsmund Bjørnstad in his enlightened contribution to the third edition of the World Wheat Book.

We need to let people know the story behind a wheat variety (modern or old) and inform us all about the real cultural (and health-related, I would add) value of the flour we use in our food.[41]

Not surprisingly, the most comprehensive review on gluten sensitivity to date suggests in its conclusions to try finding "varieties of wheat and ancient grains that are known to have lower reactivity for the condition in question".[19]

Changes happen all the time, let's help this one to go in the right direction.

—

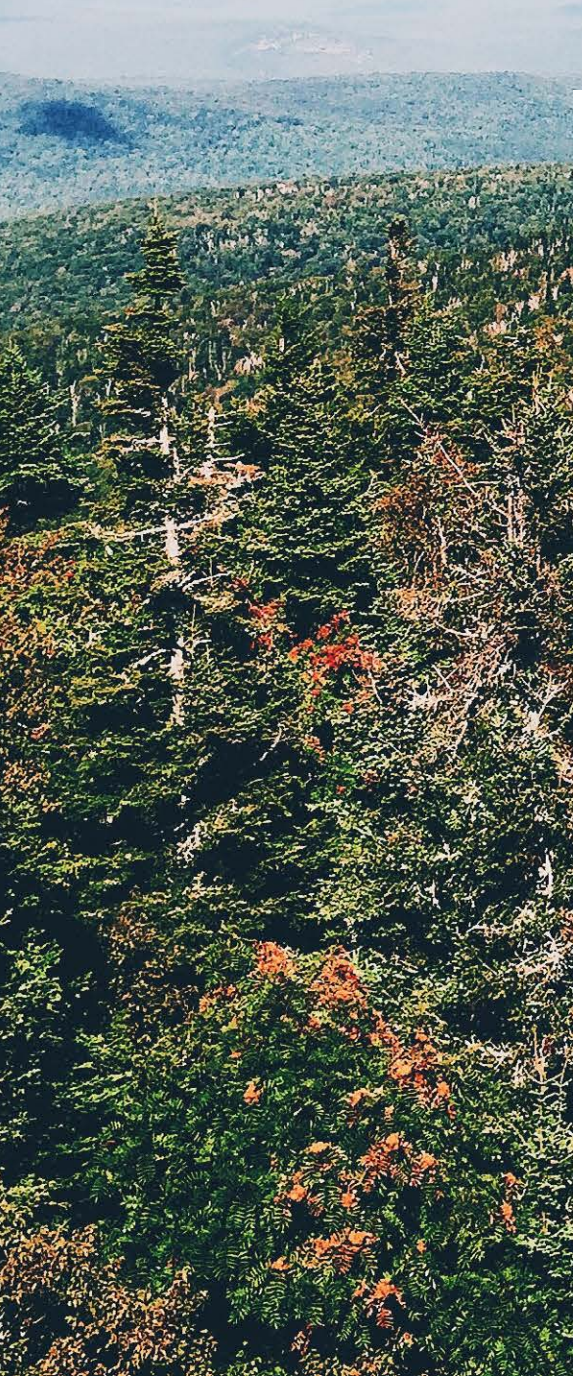
Barbara 'Elisi' Caracciolo has a medical scientist's background, with a Ph.D. in medicine and double Master of Science in epidemiology and psychology in her backpack. Due to her wheat intolerance, Barbara has gained considerable knowledge on everything grains related, with a focus on the health aspects of bread and wheat. She is the founder of *Mother Grain*, a health-conscious and eco-conscious store and mill that aims at making heirloom grain varieties more available and accessible to her community both near and far. Visit her Instagram profile to see what she is up to.

See *page 108* for a complete list of references.

JEFFREY HAMELMAN

Words: JARKKO LAINE

Photos: BRAD FICKEISEN, MICHAEL SELLERS, and GIGGS HUANG



Among bread bakers, Jeffrey Hamelman doesn't need an introduction. Well-known and loved for his book, BREAD: A Baker's Book of Techniques and Recipes—which he says he once thought of publishing anonymously—as well as his work in teaching and coaching bakers, the Certified Master Baker has inspired countless people to get started with bread making and to deepen their understanding of the craft.

In June 2016, I had the opportunity to talk with Jeffrey on the phone. For an hour and a half, we unhurriedly discussed his past and present, the craft of bread making, and what he sees in the future.

I was impressed by Jeffrey's peaceful demeanor, deep appreciation for manual work, and the way he sees baking as a way to support the society as a whole.

Here's what he told me.

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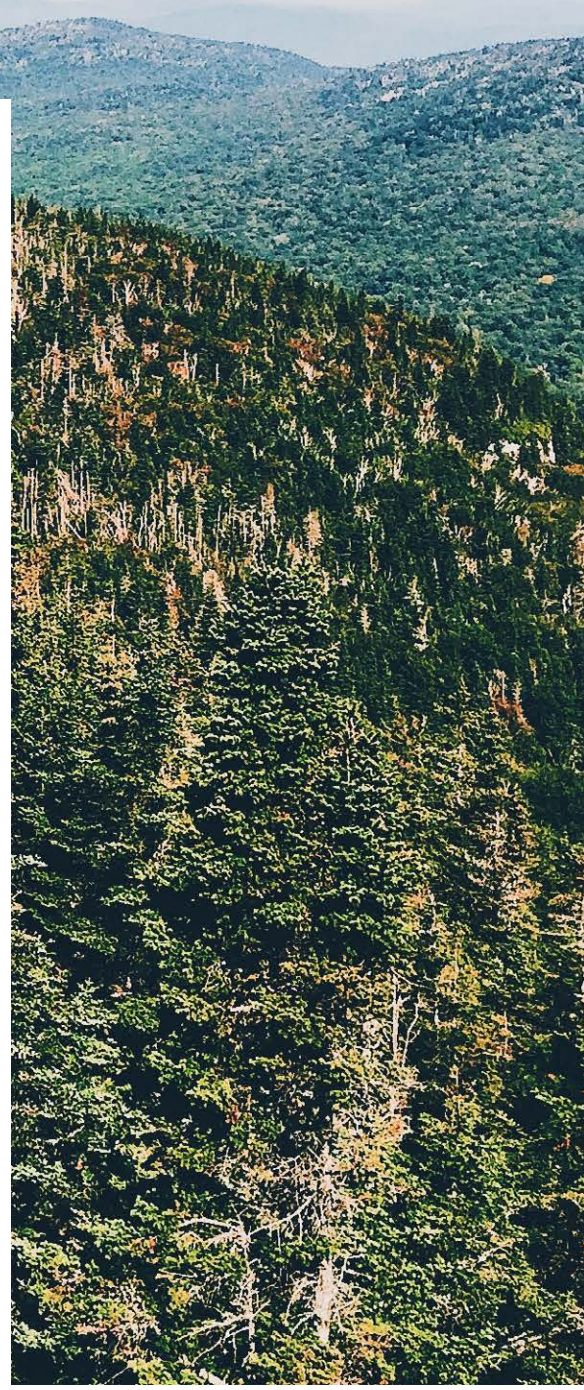


***Jarkko**: On the King Arthur website, you say, "providing nourishment and pleasure to the community through baking is the most meaningful work that I've ever done." That quote inspires me a lot, and so, I wanted to start there. How is bread making meaningful?*

Jeffrey: I've always been a believer that the bakers are some of the most fundamental people in society.

Farmers are probably the most essential members of the society, but I would say bakers are very close. Sometimes people misunderstand me as I refer to bakers being, in a sense, the lowliest members of society. But if you look at a big skyscraper in a city, it's only held up because it's got this massive foundation that provides the stability for it. In a sense, we are the foundation: because of our efforts, other people can have the nourishment that enables them to do their work.

Now, this is very idealistic too, because nowadays, the role of the baker is very different than it was 50, 100, or more years ago.

But I like to think of the baker in that regard, because that also gives us the opportunity, if we are so inclined, to see the baker as someone who is carrying on a very long lineage. Someone deeply connected to the past and all the generations who preceded us while equally connected to future generations.

"Farmers are probably the most essential members of the society, but I would say bakers are very close."

***Jarkko**: Can you tell a little about how you got started with baking?*

Jeffrey: To be honest, I'm a very lucky person, because I had a good education. I was a proper middle-class kid growing up, and there was no way that I was supposed to—whatever that means—go into manual labor.

I know that's considered to be bad advice, but college isn't right for everybody, and it wasn't right for me. It was also a time in America when counterculture was huge, where Vietnam was raging, where the entire hippie generation was flourishing. And there were so many things outside of college that were so compelling. I wanted to be a little more self-directed in the things that I was reading about and learning about.

Manual work also always appealed to me because, when working manually, you use more of your entire being. Baking, I think, is an excellent example of manual work that also entails a lot of brain functions: you have to make all kinds of intellectual decisions as well as work manually.

So, I dropped out of a very good college after two years and three days.

In the early '70s, I was living in North Hampton, Massachusetts, a very nice, fairly cultural, small college town of 30,000 people.

My girlfriend and I were trying to be organic farmers in the next town, which was crazy—the word "organic" wasn't practically even in the dictionary. We loved the work but couldn't make any money at it.

One day, I was walking down a side street I had been on a hundred times. When I looked to my left, where there had never been a bakery, I saw this woman taking bread out of the oven. She must have seen me gawking at her because she came over and we started talking.

She was a German woman who had just started a bakery and knew a lot about baking, even though she had never trained as a profession-

al baker. We talked, it seemed like for a long time, and then she said to me: "Wait here. I will bring you a loaf of bread."

When she came back, she handed me this rye bread and said: "This is the best loaf of the day."

I looked at the loaf that looked incredibly dark and overbaked. I didn't want to be insulting, but inside, I was saying to myself, "She's figuring either she'll give it to the kid—meaning me—or she'll have to throw it out because it's so overbaked."

So I took it from her, and when I ate it later that day, it was one of those proverbial moments that are just totally imprinted on your entire being. It was a revelation in my mouth.

Farming wasn't going well, so I jumped on an offer to work as maintenance staff in an artist community in the Berkshire Mountains for a steady paycheck—$20 a week plus room and board! About a year later, I went back down and asked the woman if she'd hire me.

I remember how she said to me: "No. You can't bake. You're an American."

And she meant it.

She had a Parisian as her pastry chef, and a bread baker from Grenoble. The products were classic German and French products.

She wouldn't hire me, so every couple weeks, I'd show up and ask her again, and she'd say "No!" Once, I even showed up at her house with this hideous loaf of bread that I'd made for her.

It was eight o'clock in the morning when she opened the door in her bathrobe, and I said: "Susanne, would you hire me?"

She screamed "No!" and slammed the door in my face.

Eventually, she hired me, on the condition that I make the pretzels. So, I started working for her at 6:00 A.M. Wednesday morning, September 1st, 1976. And it was probably 6:02 A.M. when I said, "Yep, this is the work I'm going to do. This is it."

"She wouldn't hire me, so every couple weeks, I'd show up and ask her again, and she'd say "No!" Once, I even showed up at her house with this hideous loaf of bread that I'd made for her."

The French didn't particularly care for me because I was an American who couldn't bake and who certainly didn't have any cultural history with baking. But I was eager, and I felt like I absorbed tons of small things just because I wanted to learn as much as I could.

Within a week, the boss said "Remember that challah from your grandmother's recipes? Maybe we can start making that on Fridays? Oh, and I want to show you how to make *dreistufensauerteigführing*!"

She would bring all these technical German manuals and say, "Let's do this, let's do that."

The French didn't want any of that German stuff, so she was overjoyed, I think, that the American kid would do anything. And so, I felt like I was in this incredible environment where I was learning all the classics from the German baking culture as well as the French baking culture.

I worked there for five years. Then, I got married, and as I had already been living in this area in Massachusetts for ten years or more, I felt that I should leave and start anew with my wife. We moved to a small island off Cape Cod, called Martha's Vineyard.

I baked there for two years in a pretty terrible bakery. Eventually, I couldn't take it anymore and quit. I moved my family into a teepee in the woods. And then, I moved to Vermont and started a bakery in December of 1983.

From 1997 to 1999, I taught at the Culinary Institute of America, the CIA, in the New York state branch. There I devoted a lot of energy towards just trying to learn to express concepts, transmit information in ways that are clear to the students. Although I had done a little bit of teaching prior to going to CIA, now I was a full time teacher and I felt like "if I'm going to be a good teacher, I better learn how to teach."

I loved the students. It was a wonderful experience, but I missed Vermont terribly.

"The French didn't want any of that German stuff, so she was overjoyed, I think, that the American kid would do anything."

In 1999, I was in Vermont, visiting friends, when I stopped at King Arthur to say hi to a few people.

The last private owners of King Arthur, Frank and Brinna Sands, had already made the company employee-owned, but they were still at the company. Brinna saw me and came running out and said: "Would you start a bakery and a baking education center for King Arthur?"

I thought: "Wow, I can return to Vermont? Wow, I can't believe it!"

So, I came to King Arthur in 1999, and that's where I am to this day!

***Jarkko**: That sounds like it was the right choice for you?*

Jeffrey: Yeah, I think it has been a good fit for me as well as for the company.

It might sound odd, but the mission statement for King Arthur includes education. So, although it didn't have the opportunity because it didn't have a bakery or a school, it has always been interested in education. The arrival of the bakery and the school mark the real beginning of being able to educate.

Brinna had always thought that the company was about a lot more than selling flour. So, that was, for her, the completion of her vision.

King Arthur is a unique company. As you probably know, it's the oldest flour company in America. It was started in 1790, so it's two hundred twenty-six years old now—which, for America is a very very old company. It's also extremely values-driven.

The number of things that we do that we're doing out of the values commitment and not out of monetary gain or hopes for monetary gain is impressive. Frank and Brinna have always believed thathaving a successful company gives you the opportunity to do good.

***Jarkko**: Earlier today, I was listening to an interview you did with Amy Robb, where you talked about simple life and how we all can do something to improve the condition of humanity, within our limits. How do you think we can contribute through bread?*

Jeffrey: One of the reasons why I've been so glad to be a baker all these years is because it gives you the opportunity to give bread away.

There are some pretty shameful aspects in the United States, not the least of which is how we never stop going on and on about how we're the greatest country on Earth and yet 17 percent of the population is food insecure! In other words, they don't know if they're going to have enough food to eat.

Being a baker gives you the opportunity to contribute directly to providing nourishment for people who don't have the good fortune you have.

So, you know, I wouldn't even have started the bakery or the school without first having a list of places that would pick up our day-old products seven days a week. I felt that while it's fine to give stuff to the pig farmer, let's first feed the humans. And then, we'll give the pig farmer something.

***Jarkko**: Speaking of the bakery, do you still participate in its daily work?*

Jeffrey: We opened the bakery in June of 2000. For the first 12 years, I was in production four days a week and in the office one day a week, except when I was teaching—which initially was one week a month and then became a couple of classes a month. Then, slowly, the need for me to teach started growing.

About four years ago, my supervisor said, "You can't be on the schedule anymore. If you're in the bakery in production, it's a bonus, but you can't be on the schedule because you're doing too many things that you have to focus on."

We have 18 full-time bakers, and we keep slots for a couple of students who go to culinary school and have a required externship. It's an excellent team. I might go down there for a sort of a cameo appearance, just to hang out and shape some rolls. Like earlier this morning: We had a few thousand rolls to shape for an account. We do it all by hand, so, I was down there just to do that. But I'm not on the production schedule.

When that change happened, it was a hard adjustment for me because I still feel that I'm a baker. That's my identity, so shouldn't I be baking?

But I said to myself, "If I'm not going to be spending time in production, I'm going to find things that I can do, that are going to be valuable, and change my focus."

So, I've been doing a lot more teaching and more outreach in the baking world. I've also been working with the federal prison in New York State to develop a certified baking program for inmates. It'll be a two-year program to teach inmates how to bake so that when they get out, they can have work that gives them self-respect and discipline and all the other things that come with baking. That's scheduled now, hopefully, to go live in November.

That kind of stuff wouldn't have been possible for me to do six years ago, but now in my new position, I can do that.

***Jarkko**: That's one more way how baking and bread can make a difference! You mentioned that you shape the rolls by hand, and on the bakery's website, you say that you're "maximizing hand production." I love that, but I'd like to hear why this is important for you. Is hand-made better, or what makes it different?*

Jeffrey: Is hand-made better? Well, it depends on whose hands are doing the work.

There are some pieces of equipment that humans will never be better than. Humans just can't mix as well as a mechanical mixer. And dough sheeters. What dough sheeters do, humans can't do it.

But after that, I think a skilled baker is better than any machinery. Arguably, a dough divider is going to be an awful lot quicker—and we actually use one now. But when it comes to shaping, a skilled human is better than any mechanical shaping equipment. I have to be careful about that, though, because the new generation of shaping equipment is very gentle. It's very accurate. And of course, it's very fast.

But, what if we then give up shaping by hand, and end up are mixing in a machine and dividing the dough hydraulically, and shaping it by machine. What skills are left?

To me, there's always been a very deep enjoyment in shaping. It's something I've never lost my pleasure in. I love the act of shaping.

I also think it can be a time when you get to be social. Like this morning: Five bakers standing around, all shaping these rolls. Because they have the skill, they're not even thinking about what their hands are doing. Their hands are independent of their minds in a sense, which frees them up to chat with their cowork-

Jeffrey Hamelman teaching a bread making class

ers. Isn't that more pleasurable than having a machine that shapes all the rolls so that you have one person just standing there looking at a machine all day long?

***Jarkko**: Yeah. Even if the machines made the best bread ever, using them would mean that some people are not working and are left out of work, their craft no longer appreciated. If someone finds pride in doing something with his or her hands, why take it away?*

Jeffrey: Well that's right. At the bakery, one of the things that I've kind of mandated—that's a big word, I know—is that if you're on the bread shift, every week you're going to have at least one mix shift, and at least one oven shift, and everybody shapes every day. This way, people are rotating through stations and stay more engaged in the totality of their work. They have more variety in their work week, which has got to be healthy.

People who are at the oven take such pride in doing the best work possible!

There's this is one guy who works in the bakery, a Frenchman from Alsace. He's been baking for 52 years—he started as an apprentice when he was 14. When his bread is coming out well, his face is all light and open and happy, and if he doesn't like the bread one day, then you can see it all over his face. After 52 years!

That kind of pride never goes away. It's not like, "Well, I learned how to shape bread, and I learned how to bake bread. That was fun. Now I can stop caring about it."

A lot of the work that we do in the world of bread is not new and innovative.

The work is something that has been going on for decades if not centuries, and what we're trying to do is to every single day do the best we possibly can. We're not doing new things every day. We're trying to perfect something that was worked out hundreds of years ago.

***Jarkko**: In your years as a baker and teacher, you've witnessed, and even fueled—I don't know how you would call it—maybe a movement or an explosion of small bakeries and artisans. What do you think has changed in these years? Is it all good, or do you also see some negative sides to this development?*

Jeffrey: You're absolutely right that there is an explosion of what a lot of people term artisan baking, and generally speaking, I think that's very good. There are more good bakeries in America now than probably at any other time in history.

America is an interesting place in that not having had hundreds or even thousands of years of food culture history—for the Caucasians in America—we are ruthless in that sense. That's probably one reason why Americans are always running from one stupid dietary fad to the next. But at the same time, the fact that we haven't had a deep hundred-year-old food culture means that we're able to absorb things from different cultures and personalize them, in a way make them our own.

Nobody ever thought America could teach anything about baking to the rest of the world. And now, maybe there are some things happening here that really can be inspiring and valuable for bakers from other countries.

There is one thing to guard against... I think the modern generation are more inclusive now than we were 25 years ago. But when good bread really started returning to the U.S., there was a tendency for it to be an exclusive rather than an inclusive thing.

The new generation of bakers would feel like they were somehow better than other bakers who had been baking for 30 years longer but who were using shortening instead of butter. Well, they might have been doing that, and maybe that wasn't the best decision. But look at this: they could outwork you three-to-one.

I don't like adjectives that are used to denote superiority. I use the word artisan from time to time, but only because there still isn't a word that expresses that style of baking. When you use that as an adjective of superiority, that's what's a little bit troubling.

"I don't like adjectives that are used to denote superiority. I use the word artisan from time to time, but only because there still isn't a word that expresses that style of baking. When you use that as an adjective of superiority, that's what's a little bit troubling."

Last month, I was in Australia at a food festival, where I taught a two-day bread-making class. There, I saw the same thing of exclusiveness.

At the beginning of the first day of the class, I talked about what we were going to do, the objectives, and the products, and all that stuff. Then, I gave everybody a chance to introduce himself or herself and just talk for a couple of minutes.

One guy said in complete seriousness, "You know, I don't really know that I belong here."

I thought he was going to say he hasn't got a lot of experience, or whatever it was. But no, not that at all.

He said, "I haven't been around commercial yeast for twenty years, and I feel like I'm in a land of evil now."

Then, he went on a long monolog about how the class was evil because we were using commercial yeast. I turned it into a gentle joke for the next two days, but my deeper feeling was that this was exclusive behavior. If you say that anything that's made using yeast is no good, well you can eat your naturally leavened croissant all you want, but I think a careful, judicious use of yeast is not an evil act.

***Jarkko**: At King Arthur, your focus is more on the professionals, but how do you see the role of home bakers in bread making and all this talk about artisan baking?*

Jeffrey: I think home bakers are immensely important and incredibly valuable.

I have to tell you that I have heard people say to me so many times, "I'm just a home baker. I'm just an amateur."

I just smile and say, "Yeah, you're an amateur. That's right. You're an amateur! It comes from the Latin, and the root means a lover."

It's the amateurs who are bringing the baking world forward. They're innovative. They're endlessly curious. They aren't restricted to just doing a certain production because that's what their business model is. Of course, they make a lot of mistakes, but that's because they are always exploring new areas.

My heart goes out so much to home bakers. I mean they're usually restricted by lousy equipment: their mixers stink, they're ovens are horrible. But boy, the quality of the bread the amateurs are making is startling.

***Jarkko**: I think one reason that can make us say "I'm just a home baker," is that home bakers and professional bakers increasingly hang out in the same settings, for example on Facebook and Instagram. While I think this is a positive development—the community is friendly, and you learn a lot from watching the professionals—it can lead to home bakers comparing themselves to professionals.*

Jeffrey: I think you're right, and I understand that. I mean, if I'm hanging out with a home baker and we're shaping bread together, they're going to feel like they're in a different league.

I mean, I can shape with my eyes closed because the knowledge is in the hands.

I actually did that once, maybe two years ago. We make challah with four-strand braid on Fridays, and I wanted to see if I could make the entire day's production with my eyes closed. And so I did. I only allowed myself to open my eyes each time I finished a tray and then I had to transfer it to a speed rack. Then I'd close my eyes again and find the next four strands, roll them out into full length, and then braid them together. It was as fun as could be!

But, you know, a home baker obviously can't do that, so I guess they can feel like they're "just" a home baker.

But nevertheless, I love home bakers.

***Jarkko**: Yeah that's good! In a way, I guess it's a healthy thing for a home baker to realize that we are not at that level yet.*

Jeffrey: To learn any manual skill requires repetition. The reason for that, in my opinion—and I could be completely wrong from a biological sense—all manual skills involve a gestation period. I've seen it over and over and over: I show people how to make a baguette, and they are mystified because it looks so easy and they can't do it.

The only way you learn it is by repetition. At first, it's a cerebral act: first, I do this, then I do that, and then I do the following. We only know we've learned it is when it stops being a cerebral act and it becomes a tactile act. That's when the gestation period is complete, and the knowledge is in our hands.

For my recent birthday, in March, my wife knit me this beautiful tea cozy. But she also bought me knitting needles and beautiful yarn and patterns. So I started knitting.

I mean, Jarkko, what a disaster! What an absolute disaster to see me knit! It's hilarious. And it's a wonderful thing because it makes me understand what it means to be a student.

If you want to be a successful student you have to give yourself permission to mess up. Because you're going to mess up and it's only when you mess up that you learn. You have to go through a process of making all these mistakes until the gestation period is complete.

***Jarkko**: What do you think, where are we going next in bread making? Is there something new you're interested in or see growing on the horizon?*

Jeffrey: The biggest trend in the U.S. right now is bakeries having small mills in-house and using local grains. It's becoming huge, and there are a lot of great things about it.

"The biggest trend in the U.S. right now is bakeries having small mills in-house and using local grains."

For years, restaurant chefs have proudly stood up and said: "what we're doing here is fresh local and seasonal." And it almost became a cliché. But it's true that a lot of restaurants started getting their meat, vegetables, and all that locally.

Bread, for a lot of reasons, was the last part of the food world to catch up to that.

Obviously, using local grains is better for the reduction of food miles. So environmentally, it's a good idea. It's also better for the local economy because you're supporting local farmers. It's a source of pride for the bakers. And certainly, there is a distinct improvement in flavor when you're using freshly milled grains.

So, these are all good things.

***Jarkko**: Yeah, I agree. But, I'm curious. How does King Arthur see that all, it being a flour company?*

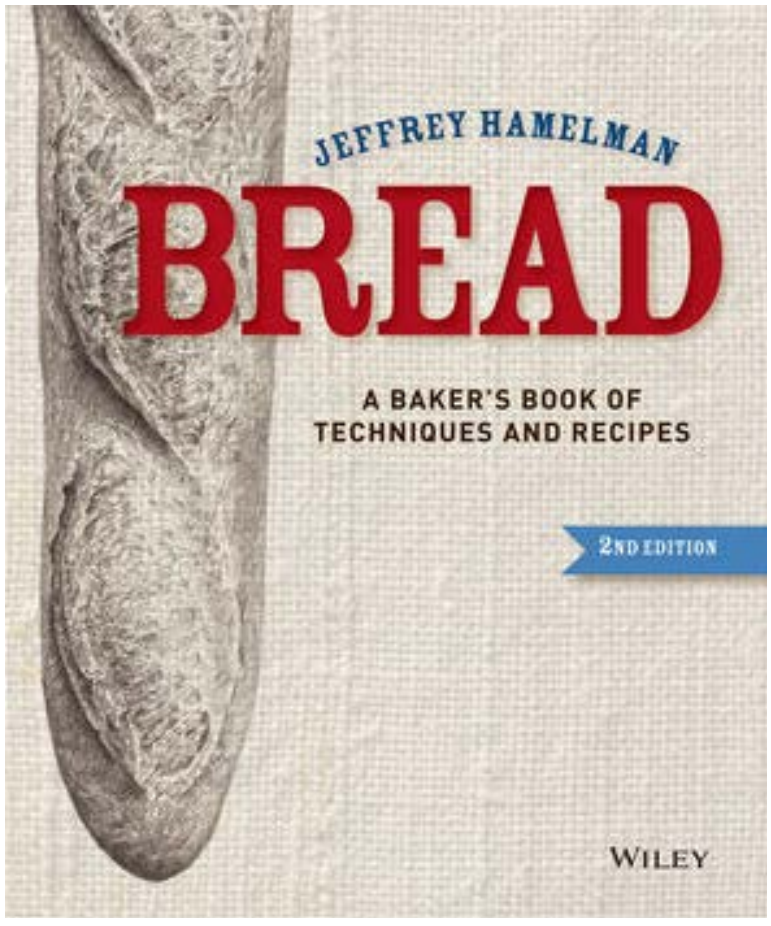
Jeffrey: Even though it's another one of these areas where it's not going to make money for the company—it might even be a reduction in flour sales for us because instead of buying our stuff, people are going to buy their local stuff—we actively support local grain initiatives.

We're the main supporters of different conferences that focus on local grains. There's one in Maine called the Kneading Conference, and one in Washington state called the Grain Gathering. We teach classes at these conferences, and we've been very actively supporting them, even though it's not a moneymaking endeavor. We support them because it's something we believe in.

***Jarkko**: Let's talk about your book a bit. Have you thought about maybe writing a new book, or do you think you already said all there is to say about the topic?*

Jeffrey: After having written the bread book, I thought very seriously about writing a second book about pastry. Ultimately, I decided against it because I didn't want to invest the time. And now, I think, I don't plan to write any more books because, probably, I'm too selfish of my own time.

I mean, one of the biggest motives for writing the bread book was that I felt at the time that there weren't really good books on bread making in English.



So, I thought: If I write a good book on bread making, I'll set a higher bar, and that will then contribute to the evolution of good bread books in English, giving somebody else the opportunity to write a book that's superior to mine so that the evolution of good books continues.

I hope you don't take this in the wrong spirit—by no means do I think the book is without flaws—but I don't think there has yet been a bread book written in English that's better than mine.

***Jarkko**: Well, I haven't seen one yet. There have been very good introductory books, but none as detailed and as thorough as yours. Yours talks to the professional as well as the home baker—maybe more to the professional than the amateur baker, even?*

Jeffrey: I definitely didn't want to talk down to the amateur baker, so I guess there's maybe more of a focus towards a professional. But not to exclude the amateur!

By the time I started writing the book, I had a lot of experience teaching, so it was clear to me... While teaching, I would just make mental notes: "OK, make sure you explain this, because over and over I'm finding people who don't get it."

Mark Twain once said something that became almost like my mantra. He said, "I wanted to write you a short letter, but I didn't have time. So I wrote you a long one."

Isn't that ironic? And and I think you see that a lot. The people who don't know the material, they just talk more. They just say it over and over and over. So, I tried to write with as much brevity as I could. I just wanted to transmit the information with the fewest words that I could get away with.

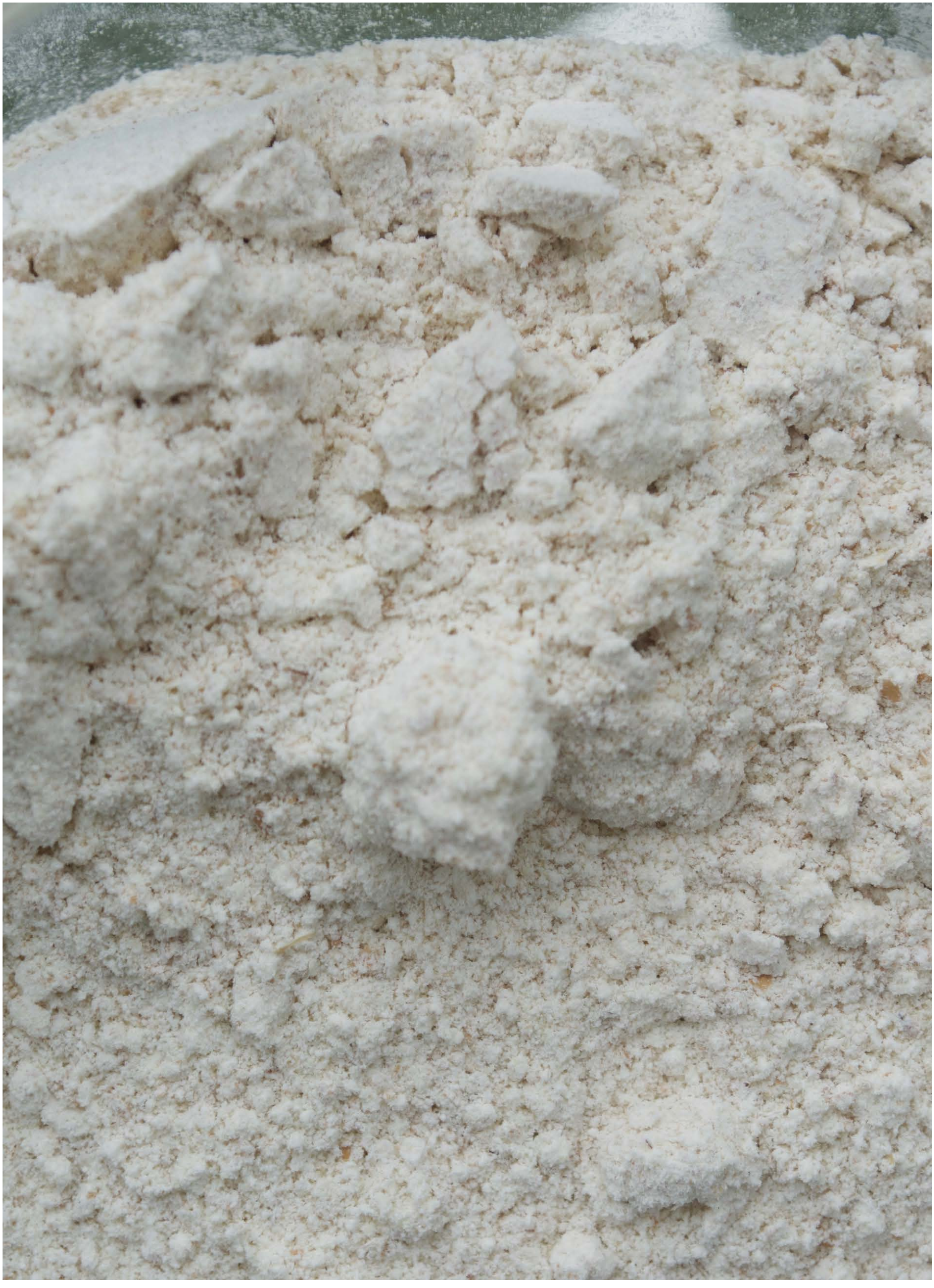
The other thing I did—this is kind of silly—was that I asked my publishing company if the book could be anonymous. My reasoning was: "The book is about bread, it's not about a person, so wouldn't it be preferable to have it anonymous?"

I think they thought I was a little crazy, that I had gone over the deep end or something.

In retrospect, I'm glad that the book wasn't anonymous because it has given me the opportunity to meet so many great people. And I've had the opportunity to travel a lot teaching in other countries and all these things.

So I'm glad they thought I was nuts.

"In retrospect, I'm glad that the book wasn't anonymous."



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