

EINKORN TALKING, FEBRUARY



Hello again, Einkorn here.

February at Lentz Spelt Farms on the Columbia Plateau is a variable month. Some years, crusted snowdrifts compose arrhythmic contours across the field, the sky icy with long-tooth winter winds. Other years, February sees a turn to spring as the open ground thaws under the daytime sun, to freeze again at night, a see-saw of soil surface densities. Around Pasco to the south, in those warmer years you'll see grain drills seeding spring crops already.

Along two edges of the field at the Lentz farm, a strip some eight feet wide had been left standing at harvest last July. This strip serves a dual purpose: as border to the adjacent fields it prevents the Farro crops from being contaminated with industrial wheat, and, all winter long a fair number of wildlife species enjoy that standing border. Mostly we notice small birds who're drawn to the standing strip, and we discover swift-footed mazes, tracks of rodents who in turn attract the attention of raptor and coyote.

This border also looks nice, tousled by winds and weighed by snows it breaks up the wheat-farmscape flatness surrounding. We're reminded how a simple thing – not to harvest every square inch – can be a present of aesthetic pleasure.

Ages ago, of course, agriculture was patched into nature in ways that left a wild panoply pressing upon the fields from the edges. This was less the case here, because most Columbia Plateau farming didn't begin until railroads had punched their way through in the late 1800s – also when industrialism had already started to occlude agrarian traditions.

As I'm thinking back on what I spoke about in January, I realize that I talked Einkorn this, Einkorn that, Einkorn at the rise of an agrarian Fertile Crescent. The fact is, Einkorn wasn't the only cereal grain that the first farmers domesticated there. Like Einkorn, Emmer was also gathered in pre-agrarian eras, and ranks as a first crop type as well.

But Einkorn is by far the older grass. Through DNA analysis, USDA scientists estimate Einkorn's age at a million years. Some of them are awed by this; one researcher quipped that, "Einkorn is so old, it was around when God was a baby." When he noticed the journalist jotting this down, he said, "Oh, don't quote me on that."

Mutations of a species are recognizable in the DNA; a species' age is extrapolated from the number of mutations, the average time lapse between mutations a known factor.

Emmer the researchers estimate at 500,000 years. Einkorn is one parent, the other parent a grass since gone extinct. The outcross doubled the chromosomes: Einkorn's a diploid with 14 chromosomes, Emmer a tetraploid with 28 chromosomes.

And a third grass appealed to the first farmers, barley, the ancient type barley known in Scotland as *Bere*, and also hullless barleys. Barley though seems to have spread by its own routes mostly, whereas Einkorn and Emmer often stuck together.

With oat and rye, the plot thickens. Yes, oat and rye also grew in the Levant, but they were not crops but species of stealth, weeds, that is. Sensing unprecedented species spread of Einkorn and Emmer through agricultural expansion, oat and rye altered themselves to get in on the act. Science calls the process *Vavilovian mimicry*, after Nikolai Vavilov who postulates that rye started out as a wild perennial; where this rye competed as weed with the domesticated cereals who're annuals, some rye subpopulations increased their kernel size and mutated from perennial to annual habit. By this mimicry, rye eventually offered itself for domestication, subsequently partaking in the staggering species spread of cereals.

But back to the Emmer. Grand tales are told of this grain, from Sumer to Egypt, from Greece to Rome. There is reason to wonder, though, how pure of Emmer the harvests were. Archeologists typically find a mixture of Emmer and Einkorn in the earliest underground silos (in first European silos, add Spelt). They deduct that the crops were raised together mixed in the field.

Let's assume that Emmer was predominant in these mixed crops, since Emmer gets more historical mention. Could it be that a mouse was responsible for that?

What gives us the idea is a recent study conducted with the house mouse, *Mus musculus*, at Washington State University. A scientist wanted to ascertain why the hard red wheat mutation survived in soft red wheat, the original bread wheat. Which evolutionary advantage helped hard wheat to succeed?

Naturally, *Mus musculus* has its own story of coevolution with humans and grains, to the extent that it can no longer persevere in the wild. The researcher fed the study mice hard wheat and soft wheat, allowing them to choose, and he proved his hypothesis – *Mus musculus* indeed prefers soft wheat; back in the day, such preference must have led to an ever higher percentage of hard wheat in the fields.

This reverse-selection process by mouse happened in Persia, much later in history than the Einkorn-Emmer phase of early farming when free-threshing bread wheat did not yet exist.

The Einkorn we know is much softer of kernel than the Emmer, some of which is so hard it has surprised the experts at USDA Wheat Quality Labs. This hardness difference makes it thinkable that the soft wheat / hard wheat scenario that played out in Persia was preceded by a similar play, a rodent reverse-selecting Emmer over Einkorn by eating more Einkorn

As peoples adapted their diets to cereal agriculture, a shift to more carbohydrates was likely. This invited the invention of a new treat for the taste buds – beer. Not that it was party time: ancient beers such as the Egyptian Emmer beer were thought of as food (just as hard cider in Britain was a food item with which farm laborers were paid for centuries).



Brewing formulas varied over the centuries, from place to place, until the 20th century when mass-production streamlined beer production to the exclusive use of hulled barley malt; only in the last few decades the use of other traditional malting grains has resurfaced. To wit, *Emmerbier* is a famous part of the Emmer resurgence in Germany today, thanks to some prestigious prizes the Riedenburger Brauhaus has won for the specialty brew.

Traveling to Riedenburg we encounter small-town charm overseen by three castles; nestled in the Altmühl Valley of Niederbayern (Low Bavaria), Riedenburg's claim to fame is its status as *Luftkurort* (literally *a place where the air cures*, i.e., a climatic health resort) located within a Nature Park. To the south lies the Hallertau, part of the region that's the largest hop producer in the world. Arguably, what we commonly call beer today – lager, that is – was invented here.

At the Riedenburger Brauhaus we're welcomed by owner and brewmaster Michael Krieger and his son, fifth-generation brewmaster Maximilian Krieger. The family has brewed since 1866, at first as a *Gasthausbrauerei* ("brewery in an inn," of which at that time there were seven in Riedenburg). In the early 19th century they built a small-industry-size brewery at the edge of town; since 1988 a new, stately building serves as warehouse, offices, and retail shop.

In 1989 the Kriegers started their transition to "ecological beer," and in 1994 they could boast to be the first German brewery to craft exclusively organic beers.

This came to the attention of monks not far away. "We were approached by Abbot Gregor of the Plankstetten Monastery in 1997," the elder Krieger relates. Known for its organic farming, especially of Spelt, the monastery was looking for "an ecological cooperator."

It was the begin of the Kriegers' journey back to *Urgetreide* – the archetype grains. "We had success with the Spelt beer, on the brewing end as well as with marketing," Michael Krieger says, noting that their *Dinkelbier* is produced under the Plankstetten label to this day.

Building on the Spelt beer success, the Kriegers went looking for Emmer. "We found a grower who sold us 500 kilograms." The Emmer sheaves on display at the brewery surprise with heads the color of burnt umber; this is typical for fall-planted Emmer, we're told.

The Kriegers also searched for Einkorn, but could not locate anyone raising that crop in the region. They arranged with the Bundessaatanstalt (federal seed bank) at Braunschweig to purchase 60 kilograms of Einkorn. "After that it took us four years of seed increase until we had enough seed to grow grain for brewing."

In the early years of using archetype grains, the Kriegers established a “quality management system” to help their organic growers arrive at optimal farm practice. Because soils are so variable in the region, farmers were on a learning curve, Michael Krieger explains. “Now we have enough growers with good practices who keep us in supply. We write five-year contracts with these growers.”

One of their farmers, Frank Aunkofer, tells us that organic weed control had been a big issue. He passed the hurdle by planting an understory crop of short-growth white clover; not only does the clover suppress the weeds, but as legume it also adds nitrogen to the soil for the next crop.

Meanwhile, at the malting plant across the street from the brewery the ancient grains presented further challenge, the Kriegers say. “After dehulling, the kernel size was a problem in the drying phase of the malting, much of the grain fell through the sieves.” The solution: an extra processing step whereby the sprouted, wet grain gets rolled; thus flattened, the kernels are adequate size for the sieves.

As for the brewing, one challenge was to balance the smaller percentage of barley malt (which is needed for its hulls) with each type of archetype-grain malt.

After a period of experimentation, the Kriegers chose to break a beer industry rule, namely to use low-protein / high-carbohydrate grain for their malt which optimizes beer volume. At Riedenburger Brauhaus the archetype grains come in at high protein, the Einkorn as high as 18 percent. “Using high-protein grain for the malt makes the taste rounder, fuller,” Maximilian Krieger elaborates, adding that high protein also renders the beer color slightly cloudy. *Naturtrüb* – “naturally clouded” –, as the label states, has found acceptance in the marketplace.

“Spelt beer has a mild, slightly sweet and spicy aroma; Emmer beer has full-flavor mouth-feel, it’s lightly sweet with a cereal taste; Einkorn beer has a hint of vanilla flavor, from the carotene in the grain,” Maximilian Krieger says.

When it comes to promotion and marketing of their specialty beers, Michael Krieger’s wife Martha Krieger takes the helm; they also employ a sales director. Their lager beer called Riedenburger Helles sells Europe-wide, while the markets for their archetype beers are expanding within Germany.



“We sell a whole lot of Emmer beer,” Maximilian Krieger notes. “It was easy to introduce it to the market, especially in Bio-Supermarkets. Einkorn beer sales are not so good, I don’t know why, maybe it’s because of the name. But if we were to quit brewing Einkorn beer, there would be plenty people mad at us.”

In the big picture, brewing with malt from ancient grains enhances through biodiversity their commitment to organic agriculture. Certification by Bioland, and membership in Slow Food Deutschland helps spread the word. Last not least, the Riedenburger Brauhaus successfully rejuvenates regional tradition: “There used to be a lot of Emmer grown around here, it’s a historic crop,” Maximilian Krieger says.

And so the 21st-century beer connoisseur’s passion gets satisfaction from “pleasure in a taste-adventure.”

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