James Wright, Production Director and 6th generation family member on the production floor in the company's new Harlow mill in Essex, England

# BACK TO THE FUTURE

## Steeped in milling history yet remaining highly competitive

by Roger Gilbert, Milling and Grain magazine

Milling everywhere has history. But no more so than in the UK where family owned-companies can trace their lineages back over generations - and no more so than the flour milling company of GR Wrights and Sons Limited, which is in its 155th year, and is in the hands of its sixth generation of family members and producing flour in North London at its Ponders Mill Site in Enfield.

In April this year the company moved into its new manufacturing facilities in Harlow, while retaining its historical mill site with limited production at Ponders End, outside London just inside the M25 motorway which circumnavigates the city.

Let's not feel that the move from Ponders End draws to a close to millers working on the Lea at Ponders End, which they have done so for nearly 1000 years The old mill has a vital short-run production obligation for specialist flour to continue to fill.

However, GR Wrights and Sons' new milling facility, built just 10 miles away in Harlow which is almost directly north of the historic mill but on the other side of the M25, is anything but historic.

In fact, quite the opposite – it's as modern as the old site is historic.

Arriving at the new Harlow mill is very much like arriving at an inner-city corporate company address. A well-established office block - which has been repurposed - dominates a corner position near downtown Harlow and is fronted by trees and a parking area that separates it from surrounding roadways of this 'new town' which was one of eight new towns established outside London - this one being in the west of Essex - in the wake of World War II in an effort to decentralise the capital.

You enter a wide expanse of an open lobby with ceramic floors and large picture windows to be greeted and then whisked to the second floor and into the modern offices of this very modern flourmill.

Not a vibration nor sound can be heard yet you know you are in a space occupied by an 18-tonne-an-hour – which processes close to 450 tonnes of wheat per day at full capacity - brand new production plant, as we meet father and son, owner/Managing Director and Production Director respectively, David and James Wright across a board room table in a classical glass-partitioned room.

The factory came online in January this year after a four-year development program which cost UK£47 million (which included the purchase of the land) and will be handling over 160,000 tonnes of wheat per year.

"We haven't been long in our offices," explains David Wright, who is affable, welcoming and willing to talk about his family's major undertaking and investment and its future in milling.

### A quick look back

The Ponders End site as a milling site on the river Lea can be traced back to the Great and Little Doomsday Book first published in 1085 and which was given a 'Sunday best' refurbishment in 1869, just two years after the formation of GR Wright and Sons Limited in 1867.

Today's company was formed by George Reynolds Wright in 1867. He had three sons all of whom worked in the business – they were George William, Walter James and Leonard. It was Leonard's son George William who followed his father and in turn passed on to the fourth generation in Kenneth Reynolds before Kenneth's son David took over control in 1982. David Wright, sitting across from us today and still in his working prime, is currently passing the running of the company to James, one of his three children.

Both David and James are graduates of the Swiss Milling School. David's training included working at Simon Engineering, just at the end of its hay-day at Cheadle Heath near Manchester, in the UK. It was a good time to have been there and to have witnessed this company before its demise, he says.

James on the other hand did his early work in milling, starting at age 11, by completing school projects before working in the mill itself and then following in his father's footstep to graduate from the Swiss Milling School in St Gallen in 2013. He became the company's mill manager in 2016 and has had a hands-on involvement in the planning and construction of the new Harlow flour mill since its inception.

## Why build new?

"If you sit down and only look at the numbers you might never do anything," says David, when asked the question of why build a new mill and why in Harlow, just 10 miles from the historic Ponders End mill site.

"The principle is that we love flour milling and we want the business to be successful not in five years or 25 years' time, but beyond that. We wanted to future-proof the business and our production processes."

Looking down at Wrights and Sons delivery lorries and its reception and laboratory area (top centre), from on top of the mill

The first thought was to build the new mill on the old site.

"But then we asked ourselves where were we going to locate and put all of the equipment needed? We have got Listed Buildings there - the original mill building and the barn are all protected and you can't knock them down.

"Old buildings, the process flow and the cost of the new equipment and the limitations of the old mill site said to us that

it was a compromised location. We felt that we should start again on a completely brownfield site and have it how we want it. It won't have the compromises and we'll have it exactly as we want. It costs a bit more but we felt if we were going to spend quite a lot of money at Ponders End then let's spend a bit more and get it absolutely right."

The new mill is fully equipped with Bühler equipment except for the silos and the packaging machines - the silos being designed and installed by Bartons of Bristol, the UK's market leader in silo design, manufacture and installation and Arodo and Fawema packaging systems. Even the new 7.5-tonne-an-hour pellet press for bran processing is Bühler's.

The company has left space for a colour sorter but not yet decided upon one.

"It's a fabulous bit of equipment. But if you are doing a lot of brown flours and whole meals there might be more of a need, but our wheat comes in very clean and I don't think there is a pressing need for us to have one, but that said we have got the space there should that decision change," says David.

He turned and asked his James what he thought!

"Brown flours and whole meals, that's where they have their value. I'm all for them. I'd like someday to be putting one in," he replied.

"But James would have every piece of new equipment if he could!" retorted his father, who said the company had the option but was yet to evaluate its benefit.

"We've got the space and we'll keep a watching brief."

The selection of mill equipment supplier and mill contractor, after considering several, was based on a decision "to go with what we know."

The build took two years and the commissioning started in December 2020 with the mill running in January.

"After that we had four months of settling in with everyone coming across from Ponders End in April - the office, the transport, etc."

Ten miles was close enough for our staff to come with us or commute, added David.

"April was the time we really got going, with everyone coming along and it was the beginning of May when the mill went into full 24-hour production.

"It's only the last month or so that we have become completely happy with the way everything is working."

## Generational change

It was clear to the visitor that a generational chance is occurring for this milling family.

David, of the older, more experienced generation, has successfully steered his family's business, as its managing director, for almost 40 years up to the point of commissioning a brand-new flour mill in an extremely competitive environment.

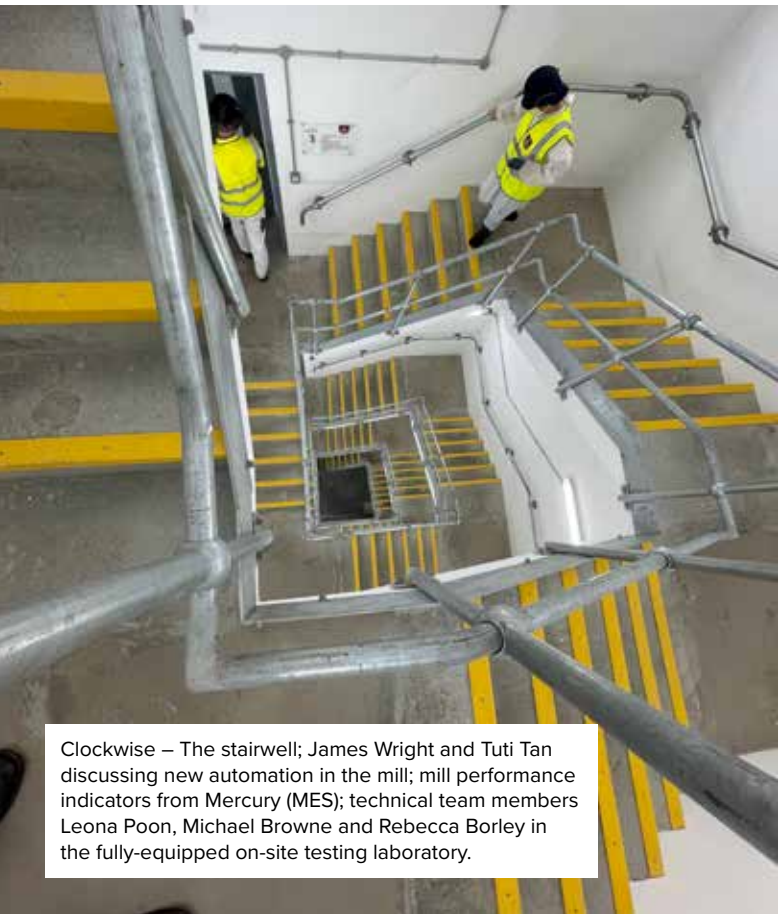
He is passing operational control across to the next generation, his son James who is clearly focused on new processes, new sensor technology, big data and the possibility of running a mill at consistently high outputs and a product quality second-to-none for the next 30-plus years.

He recognises that the ability to gather and interpret data may well provide the information needed to allow the management of a production line running 24/7 at the great efficiency, while maintaining flour standards demanded by discerning customers.

When I provoked David by suggesting that developing the business to where it is now - having commissioned a new 450-tonne-per-day factory in recent months – was only half the job and that it would be the future use of technology and data that would take the company forward and determine its success, he wasn't fully convinced.

He admitted that the focus on the utilisation of the data concerned him.

"To me it's great provided that data is used and we get benefit from it, rather than spending money on lots of reports that are just very interesting. If we can use that to improve output then



Clockwise – The stairwell; James Wright and Tuti Tan discussing new automation in the mill; mill performance indicators from Mercury (MES); technical team members Leona Poon, Michael Browne and Rebecca Borley in the fully-equipped on-site testing laboratory.

it's brilliant. But you've got to watch these collection systems because all these add-ons cost money to install and operate."

However, he readily acknowledged that data gathering is proving itself.

"We installed a system called Blackbird on our Arodo packing line, which is relatively inexpensive and comes with a monthly subscription. It's counting the bags that go through. It's web-based so you can see it from anywhere, at any time, what is being packed and every time it stops.

"In the past we relied on operators to report stoppages. But there are micro-stops throughout the day that are not recorded, and these can add up to possibly three hours of downtime a day which might not sound a lot but across the month it is.

"We've been trying for years to improve our efficiencies, which was all done with men-in-place systems. Sensors can be the way to drive improvements," he admitted.

That brought James into the conversation. He's an early convert to Bühler InSights, a subscription-based model which in his view "has been fantastic" so far.

"You can see everything, all the data of all the machines which is fed to the cloud, and we can use that data to drive efficiencies in the plant. Bühler InSights offer a free trial before you decide what modules you want to continue with. For example, we received a report today, which is 40 pages long, but goes through the complete performance of the mill; what's gone through the mill, the extraction rate, power consumptions, the storages, what's in each bin and a complete picture of how the plant is being run and what we could do to make that better.

"So in terms of that, data it's pretty fantastic. Normally, you would have to put it all on a spreadsheet and look at limited information you might have in a historic way."

James adds that this is not the SmartMill nor the new E3 Mill (which Milling and Grain will highlight in its November edition), but a new mill with Bühler's top line equipment run through its Mercury SCADA system.

"In terms of automation our equipment is the best you can get for a flour mill with all the sensors that you would expect to have today.

"The Mercury (MES) software system runs everything.

"We were the first mill in the country to have that. It was software that was still being developed and written as we were commissioning the mill. We were very much a test mill where that system is concerned. I don't particularly like the test aspect of new technologies because as a business you have to minimise risk to protect yourself. You don't want anything to go wrong."

## Operations

Asked if the company was employing more staff with the new mill, David says, "We didn't increase staffing levels at all.

"In fact, on the new site there are less people. There are 120 staff in the company with about 40 at Delta Park, Enfield where the company has a mixing and packing plant.

"That's where we make all our retail packs, mixes and blends and there's a skeleton staff of six still at Ponders End. We have 20 drivers out on the road each day."

The company operates a four-shift system in the mill and works 24/7; working four days on and four days off on 12-hours shifts rotations with one miller per shift.

The mills output is approximately 50 percent bulk and 50 percent bags and a lot of 'Skus' (which is an abbreviation referring to the sale of units and their different sized bags for different products).

## Intake

"Another great benefit here is wheat intake. There's an automated process where 200 tonnes an hour can be received, and it takes just eight minutes to tip a 29 tonne load of wheat. And that was one thing which we are particularly keen on - making sure that we were a good home for farmers to bring their wheat. And the drivers and the hauliers love it here too as they are rarely delayed," he says.

"We never tip without testing.," says James.

Right at the factory gate is the mill's laboratory.

Sampling, weighing and testing, is not included in the eight minutes tipping time, is done using Samplex spear sampling equipment that takes a number of representative samples for the laboratory team to test. This process might add a further eight minutes to a delivery.

Everything is operated automatically using bar codes which open doors and start delivery routes to the raw wheat silos. A system called 'Safe' books in all incoming wheat and interfaces with Mercury (MES) to automatically route wheat to the correct bin so there's no human intervention. The intake system utilises Bühler drum sieves and intake separators which take out a lot of the of the screenings before the wheat gets into the raw wheat bins.

If a delivery is out of spec it's rejected. Otherwise, the delivery driver waits for a signage board to identify his vehicle number and OK him to proceed to the tipping point.

Good relationships with suppliers mean that they know their contractual obligations so anything out of specification will usually be picked up before the delivery even begins. As a final safeguard all wheat supplies come through known merchants and are variety specific.

"We are boring buyers of wheat. We will stick with a variety of wheat we like until it is no longer available before moving to the next one. We buy only Crusoe and Skyfall which are our main varieties. As Crusoe is now on the way out, we will be looking around for the next one to replace it. The business is small enough to be able to find the varieties we want and not have to rely simply on what's available to keep the mill running," says David.

Incoming wheat is routed to bins based on their quality, such as protein content, etc.

The mill has 6000 tonnes of storage capacity and approximately 1200 tonnes of final flour storage.

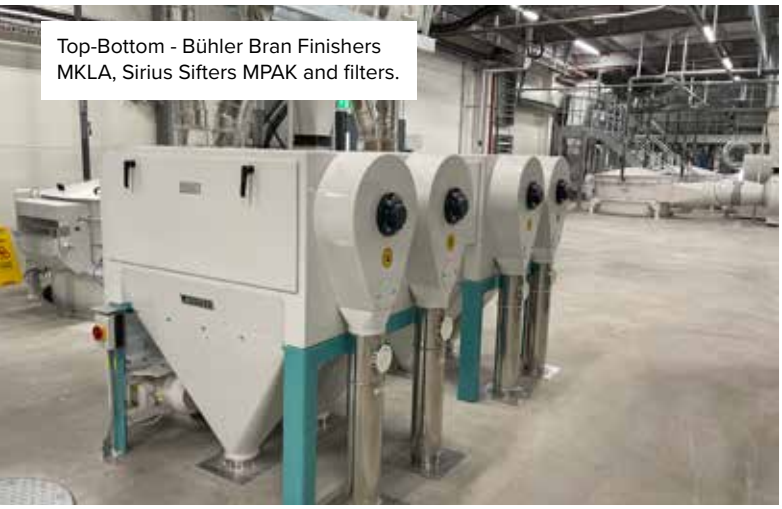
"We have future-proofed the site so have space and foundations in place for the next set of wheat and flour silos, and another mill. So we feel we are ready should we want to expand in the future.

## In the plant

Donning laboratory coats, hard hats, shoe coverings, earplugs and face masks we walk to the end of the corridor that opens into a walkway and through into the factory proper which has been purpose built behind the office block.

We entered the mill on the first level and proceeded to the control room on the roller mill floor.

James, shows us around the roll floor and in into the control room where the Mercury (MES) control system runs and monitors all the plant.



Top-Bottom - Bühler Bran Finishers MKLA, Sirius Sifters MPAK and filters.

"Both the products and the mill settings are recipe driven so everything comes across here," pointing to the first screen. The recipe attached to each product will allow for automatic roll adjustment and other settings in the mill, all controlled by the Mercury (MES) software.

Set grist and product specifications set out the requirements needed for products and the plant setup.

Included in the spec is the protein content with the option for gluten addition to top up the protein level if required.

Once cleaned and conditioned wheat goes forward for processing. The Harlow mill is a hybrid, meaning is not dedicated to either soft or hard wheat but has the ability to process both.

"If we want a higher protein flour we will tend to blend in higher protein wheats, such as Canadian."

What we want is a consistent product for the recipes we run and the best way to achieve that is to blend, blend and blend some more. The more wheat you can blend the better. This irons out any small inconsistences that may occur and the scope for wheat blending here is very good because of the bin set up we have. We can blend from up to 26 different raw wheat bins.

"From the raw wheat bins the wheat is cleaned again in the screen room which is also incorporated into the mill building for optimum plant supervision. Cleaning is carried out on the Bühler Vitaris Combicleaner – almost a whole screen room in one machine and the first of its kind in the country. Water is added using Bühler MOZL intensive dampening equipment which ensures moisture levels called for by the recipe are achieved accurately."

Conditioning times vary depending on the wheat type with consistency ensured using first-in-first-out bin dischargers.

"From this point it's brought into the mill with the opportunity to blend once again before second cleaning. Bühler Scourers and Aspirators remove the dust from the crease before entering a holding bin where it is weighed before going onto the first break."

We have the option to pass the wheat through Bühler Wheat Peelers which have a more intense scouring process prior to milling taking off a much higher percentage of the bran layer before going onto first break, adds James.

"What we find with peeling and scouring, is that stocks perform better in the mill, there is less fragmented bran to deal with and it also reduces the potential for microbial activity."

We use double roller mills on first break and when asked the purpose James says it's a practical benefit is it gets more space for roller mills on the floor. We only use them here on first break and not on any of the reduction passages.

Building new has allowed the company to 'engineer out' issues that posed safety risks to millers and staff, particularly with regard to the roll guards on the high rollers, where wheat flakes can gather between the separate rolls to pose a safety or fire risk.

The roller mill allows for automatic roll gap adjustment as part of the Mercury-based recipes. Tighter roll gaps mean a harder grind.

Another feature is the automatic diverters and adjustable tube screw feeders that allows for the diversion of stocks around the mill as it exits the sifters with the ability to automatically vary the feed of these stocks into the flour streams depending on recipe.

"This allows us to fine-tune the flour and achieve a more accurate distribution of different bran stocks when making specialist brown flours.

"We've built this whole milling facility based on our experiences gathered at Ponders End," he adds.

## Steps in the process

The mill uses all top-of-the-line Bühler equipment - Antares roller mills MDDR, Polaris purifiers MQRG and Sirius sifters

MPAK sifters that together process the wheat into high quality consistent flour.

Flour extractions based on the scales at the beginning and the end of the mill process and on our visit showed flour yield at 78.7

- where the company wants to be

"There is no wastage in this mill," says James. In fact, it's the downtime for maintenance, that impact the bottom line of a modern mill.

"We use the Ultimo maintenance package to monitor preventative maintenance work that is required to help ensure good plant reliability.

## Replay

To gain greater insight into what is happening and what has previously happened within the mill, the control screen can go to 'replay' mode and operators can go through the process from start-up of any run to check where and why a problem might have occurred.

When the mill is running within the predefined parameters the system shows up green but as soon as a falls outside those tolerances it provides red indicators to alarm and inform the controller.

"In replay mode you can see where things might have gone wrong and how they might have been corrected," says James.

"I can go back three weeks and see what the production runs were looking like which has been especially useful at correcting issues during commissioning You can really find out what happened and what it was that caused shutdowns or other interruptions during the shift. This makes it easier to find permanent fixes on those issues.

"Having 24-hour visibility of the mill is fantastic."

## Once milled

The company uses Bühler loss in weight feeders for accurate dosing of minor ingredients added to the flour stream. Following processing the flour moves past an online Bühler NIR Multi Online Analyzer MYRG which monitors in real time during milling, continuously evaluating protein, moisture, water absorption and bran specks.

What is fantastic about Bühler InSights, he says, is that this quality data is totally tied into the production data so you can go back to any point-in-time and see what you were making and the product's test results at that time. And there is also a traceability option built into Mercury (MES).

## Comparing with the E3 Mill

"In our view this mill's control system and equipment compares very favourably with the E3 Mill that Bühler has developed," adds James.

In fact, Mercury (MES) is the latest control system from Bühler and GR Wrights and Sons has been the first company in the UK to have installed and use it.

## Final checks

Quality assurance at the mill tests the flour produced every hour with a sample going to the laboratory.

"We are using both the on-line NIR and the tests from physical sampling in the laboratory at present which are comparing very well.

Food safety is paramount and so a robust sieving and redressing system is in place to ensure product integrity throughout the process. There is also an option once again to blend flours to meet final specification before going to the warehouse for packing in a range of bags from 500g upward via the two packers - Arodo for big bags and Fawema for retail bags - through to bulk out-loading when flour is dropped from three 80-tonne out-loading bins into tanks of 29 tonnes.

Finally, everything is weighed off at this mill, from the cleaning and screening section through to the flour and bran produced. There is no unexplained waste occurring in the process. The bran, by the way, goes to animal feed trade.

"We pelletise the bran - which is a new experience for us but that returns a premium as a pelleted feed material, creates very little dust and the increased density means more can be transported on a lorry."

Bran first goes into one of three 35-tonne holding bins which automatically start and feed the pellet press as they fill.

## Key components

From the latest roller mills from Bühler, with recipe-driven automatic roll gap adjustment, automatic roll temperature monitoring to a control centre using the latest generation of the Mercury SCADA software along with Bühler's MYRG technology for continuous online measurement of finished products (including protein, moisture, water absorption and bran specks) to Bühler InSights that analyses all aspects of production, yield efficiency and downtime, this mill ranks high on the list of the most advanced ever built.

In addition, the mill has Bühler's up-to-date air makeup system which monitors temperature and pressure within the building and


utilises heat recovery to control and filter all process air.

In addition to the Blackbird monitoring software installed on the company's packing equipment, there is also a Mettler Toledo Freeway software system for data recording of check weights, metal detection and check quality data and operator checks.

## Departure

Leaving such a dynamic, ultra-clean and positive atmosphere of this new mill through the walkway back to the office block was difficult.

David accompanied us down the stairs to the foyer. The elevator trip up in the morning had bypassed the stairwell which, on walking down to ground level, is lined with historic pictures in chronological order and information pertaining to each of the six generation Wright family members, and others, that in my mind reinforced the concept that this new, ultra-advanced and wholly modern mill was built to protect the hard work of the past by future-proofing the business for the next 155 years of family ownership and operation.

*Please see our interview with David Wright on Pages 112-113 in this issue*