

THE ARTISAN ROASTER

THE COMPLETE GUIDE
TO SETTING UP YOUR OWN
COFFEE ROASTERY CAFÉ



DAVID ROSA

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by The Artisan Roaster Enterprises

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DAVID ROSA



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FOREWORD

It's a pleasure to preface this book about one of the most exciting and fascinating commodities in the world. For all too long there has been a lack of available knowledge about coffee roasting as our industry has evolved into what it is today. Who could have imagined the spectacular growth and diversity of the Australian coffee industry? From the seventies and eighties, when international and national roasters dominated the market, to the emergence of the artisan roasters in the early 2000s, it's a testament to the roasters, cafés and passionate coffee consumers.

Back then, for those starting up coffee roasting, learning the art wasn't easy. Invariably those with the knowledge saw no reason to share their hard-earned expertise with potential competitors. (Thankfully, though, there were generous exceptions.) The aspiring roaster could find few reference books apart from Jobin and Bernhard Rothfos who were writing for the European market. Very little else existed that was instructive or, indeed, accurate.

As the artisan and speciality markets continue to grow and we have a proliferation of boutique and micro-roasters in all states, the need for information has become insatiable. Coffee roasting has a universal appeal, drawing in folk from every possible background and age. This book is written for those people – and it couldn't be better timed. David is certainly one of those generous exceptions, sharing his expertise on all aspects of establishing a roastery and the various pitfalls of running a successful business. This book covers every aspect, from coffee roasting through to marketing, branding and streamlining a coffee operation. What David shares is invaluable, informative and concise. It perfectly reflects his enthusiasm, honesty, thirst for knowledge and, not least, his sense of humour. I have no doubt this will be read, enjoyed and used as a guide for all new roasters as well as current roasters worldwide.

ANDREW MACKAY
DIRECTOR OF COFI-COM TRADING

INTRODUCTION



My first day in 1997.

It's September 9, 1997 and my then business partner and I open the doors of our new shop, Bay Coffee Roasters, in Neutral Bay for the first day's trade. All shiny and new, there had been a lot of interest in the neighbourhood prior to our opening day about what that strange machine in the window did: "You mean you roast coffee? I thought it just grew on trees like that!"; "Grind it for what, you mean it's not instant?"; "Good luck man, no-one will be interested with the Woolies across the road." Our first day's trade was \$150 (a sum I'll never forget). I was 28 years old, my wife was expecting our first child and I had left my well-paid job as a Marketing Manager. WTF had I done?

From that first day it became apparent our retail marketing and sales strategy had to focus on educating our customers on the joys of freshly roasted "real coffee" and its benefits. Oh, and did I mention it was 1997? So being Mr Practical I figured it was time to pull out my trusty old Uni textbook on Basic Marketing. It was gonna be just like I'd studied at Uni, but scaled down to the local micro level, one customer at a time. Oh, God....

Fast-forward 19 years and I am selling my company and its associated divisions. It's December 1, 2016 and I've just been handed the biggest damn cheque I'll probably ever hold in my hands. During those years I'd learned so much about coffee roasting, marketing and sales, consumer behaviour and, to a tiny extent, helped mould the industry in Australia into what it is today, a massive specialty coffee market known as the "Third Wave" that shows no signs of waning or running out of steam (pun intended). I feel very lucky and privileged to have been a part of this spectacular period of growth and change in the coffee industry.

It was a conscious choice to keep Bay Coffee small. We started as a micro-roastery, and while we grew considerably tonnage-wise through wholesale opportunities later on, I never lost sight of what we were about – a specialty artisan coffee roaster. I also didn't want the stress and headaches that went with being a larger brand. I loved my team, and we all had a great time doing what we did well.

Despite my years in the business I am not a household name. I chose not to name the brand after myself, and being the shy retiring type, I always kept a low (almost invisible) profile in the coffee industry, flying well under the publicity radar. So when it was separately suggested to me by both Andrew Mackay and John Russell Storey from Cofi-Com Trading (two Aussie coffee men I seriously respect) that I should write an Australian "flavoured" how-to book on coffee roasting, I initially balked at the idea. "Me? No-one knows who the hell I am!" I exclaimed. I also needed some time after selling the business to clear my head and to do things I'd let go over the years (like playing rock music) before I was ready to even think about doing anything coffee related again. Call it a coffee industry detox, if you like.

About 15 months later I met with John again. After several coffees he brought up the subject again. Once more I deflected the idea. Two weeks later though I thought, "You know what, maybe he's right." So I started to think hard about the concept. There were several very good but quite technical books out there on coffee roasting and some lovely coffee table-style books about coffee (sounds like a Seinfeld episode). But these books don't really teach you anything about coffee or about how to start and run your roastery. So I thought, if I'm going to do this I'm going to give you, dear readers, the whole warts-and-all story from beginning to end. Not only am I going to give you a very practical resource on how to roast coffee, but I'm also going to give you an overview on how to run your business day-to-day. We'll cover the entire process, from the extensive planning required before you even open your doors for your first day of trade, to when you hand over the keys to the new owner and wish them the best of luck.

To write everything in infinite detail would require a 1,000+ page tome. So what I'll give you in this book is very practical, no-bullshit information and I will highlight tips/tricks that I picked up over the years. You'll learn from my successes, and more importantly, my mistakes, and hopefully not repeat these yourselves, because if you do after I've warned you, then do so at your own peril!

Our first day's trade was \$150 (a sum I'll never forget). I was 28 years old, my wife was expecting our first child and I had left my well-paid job as a Marketing Manager. WTF had I done?

There are many good books out there on each area I cover in this book if you want more detail, and I sincerely encourage you to further educate yourselves, for you never stop learning. I will give you what I consider to be the important information you need to know and then you can go off and explore the topics in greater detail in the other resources.

Lastly, the focus of this book is on the specialty coffee area of the industry rather than the commodity area, on artisan roasting (15kg roasters or less), and on setting up a retail-based coffee roastery/café (I won't cover industrial coffee roasting setups). I hope this book will be equally as useful to home enthusiasts as to those considering starting up their own specialty coffee roastery and brand, as well as established roasters who might be keen to hear what I've got to say. Finally, while this book has an undeniably Australian flavour to it, I have done my best to keep the topics and references as international as possible for coffee enthusiasts everywhere.

THE BOOK ITSELF IS SPLIT INTO THREE KEY PARTS:

- **PART A: GETTING STARTED**
- **PART B: ROASTING COFFEE**
- **PART C: RUNNING AND EXITING YOUR BUSINESS**

Each part is further broken up into the key topic areas and phases of the business. Along the way, I invite industry experts who I respect in their fields to offer their advice and expert tips on topics such as selecting your coffee roasting equipment, green bean sourcing and QA, design and branding, and sales and marketing.

Unlike beer brewing, coffee roasting is always marketed as one of the most serious things in the world. Why is that? Both brews give us equally great pleasure, but it just seems wrong to have a sense of humour in the coffee industry! You may have noticed by now that I write in a direct style and sometimes use mildly offensive language. Rest assured, however, that while I will occasionally joke around and mess with your heads a bit, I do approach the topics covered in this book very seriously. Seriously ...

Having said that though, one of the more interesting bonuses of running a specialty coffee roastery is the people who walk through your shop door over the years. I have struck up so many amazing friendships with awesome longtime customers. That said, you do encounter your fair dose of strange people too! So with that in mind, I may diverge from time to time, to share with you some stories from my time dealing with Joe Public in the specialty coffee industry.

Without fail the work Christmas parties of old would always end with drunken stories of some of the more interesting customers that came into the roastery, either as one-offs or regularly until they found another place to haunt. So stay tuned to read about "The legend of Hunchy", "The gentleman we fondly came to know as 50 Cent" and "The newspaper-snatching crazy woman we fondly knew only as Blondie".

So let's get started! See you on the other side ...

DAVID ROSA



A BRIEF HISTORY OF COFFEE DRINKING

(THE CONDENSED VERSION)

Legend has it that an Arabian goatherd dude called Kaldi found that some of his goats got frisky around a dark green-leafed shrub with bright red cherries. Kaldi, being a lonely shepherd, liked the frisky goats as they were more outgoing and had a certain mischievous look in their eye. He soon determined that it was the bright red cherries on the shrub that were causing the peculiar euphoria and after trying the cherries himself, he learned of their powerful effect. Kaldi shared his secret of the strangely attractive frisky goats and the stimulating effects of these magical red cherries with the local monks. The monks, to assist their brethren to stay awake during extended hours of prayer, then exploited this stimulating effect. Before long the secret spread to other monasteries around the world. Coffee was thus born, thanks be to God. The fate of the frisky goats remains unknown.

Of course, this story is complete bullshit, but as in the tradition of the great religions of the world, why let truth get in the way of a good story? More recent botanical evidence suggests a different coffee bean origin. This evidence indicates that the history of the coffee bean began on the plateaus of central Ethiopia around 850AD and that it somehow was brought to Yemen where it was cultivated since the 6th Century.

Legend has it that an Arabian goatherd dude called Kaldi found that some of his goats got frisky around a dark green-leafed shrub with bright red cherries. Kaldi, being a lonely shepherd, liked the frisky goats as they were more outgoing and had a certain mischievous look in their eye.

Kaldi with his somewhat stoned-looking frisky goats.



It wasn't until the 12th Century that Arabs brought coffee beans back home, roasted them over fire, ground them up, and stirred the grinds into animal fat. They called the drink "qahwa," reportedly meaning "that which prevents sleep". Incidentally qahwa, also written as "kahwah", was one of many Arabic words used for wine. You see, in the process of stripping the coffee bean's cherry-like husk, the pulp can be fermented to make a potent, alcoholic beverage with quite a kick in the palate! While the Koran forbids wine or other such intoxicants, Muslims enamoured with coffee argued that the brew was actually a stimulant!



Ottoman Empire Turkish coffeehouse.



Charles II rocking the Brian May hairdo.



Emilie du Châtelet.

As coffee roasting and brewing techniques evolved, the drink became so popular that, in Constantinople in 1453, the Turks in the Ottoman Empire amended divorce law to include a lack of daily coffee as grounds for a woman to divorce her husband. Coffee had become a daily necessity.

By the 17th Century coffee appeared in Europe for the first time outside the Ottoman Empire. The first recorded coffeehouse in Europe was in Venice in 1647, although the Italians didn't really kick into gear with their coffee culture until the 18th Century with the famous Caffè Florian (1720) being Italy's oldest continuously running café located in Venice's Piazza San Marco.

The history of Viennese coffeehouse culture is closely linked to the end of the Siege of Vienna in 1683. Legend has it that the Viennese citizen Georg Franz Kolschitzky (1640–1694) was the first to obtain a licence to serve coffee in the city following his heroic actions during the Siege of Vienna. The coffee beans left behind by the Turks were the basis of his success. However, the first coffeehouse in Vienna was actually opened by the Armenian spy Diodato. He served at the Viennese Imperial Court and was a man full of secrets. He knew about the dark beans and the art of preparing coffee from his home country.

Of all places, England was also an early coffeehouse adopter! The first coffeehouse in England was set up in Oxford in 1650. A building on the same site now houses a café/bar called The Grand Café. From 1670 to 1685 the number of coffeehouses began to multiply, and also began to gain political importance due to their popularity as places of debate.

Charles II later tried to suppress the London coffeehouses as "places where the disaffected meet, and spread scandalous reports concerning the conduct of His Majesty and His Ministers". The public, of course, flocked to them.

The rich atmosphere of early London coffeehouses was available to anyone who could pay the one penny entry fee, giving them the name Penny Universities.

Ah Paris, mon amour! Pasqua Rosée established the first coffeehouse in Paris in 1672 and was soon followed by the Sicilian chef Francesco Procopio dei Coltelli who opened Café Procope in 1686 in *rue de l'Ancienne Comédie*, 6th arrondissement. This coffeehouse still exists today and was a popular meeting place for enlightened dudes such as Voltaire, Rousseau and Denis Diderot. How cool is that?

Of course, as coffeehouses were fun places to be and debate the ills of the world, you had to ban women. The banning of women from coffeehouses was, however, not universal, although it does appear to have been common in Europe. In Germany, women frequented them, but (surprise, surprise) in England and France, they were banned. Rumour has it that Emilie du Châtelet, a French natural philosopher, mathematician, physicist, and author cross-dressed to gain entrance to a coffeehouse in Paris in order to hang out with her Enlightenment mates Voltaire and Diderot.

So there is a very condensed history of coffee drinking. What makes coffee so varied and delectable, however, isn't just the bean, it's also the roasting of that precious bean. When heat is applied to green beans, those beans produce and release oils, and their natural sugars caramelize, contributing to the bean's colour and flavour. Historically, roasting methods varied from one region to another, with roasting over open fires or baking inside ovens being the mainstays throughout the East and West.

Photo courtesy of diavoletto2718.

A BRIEF HISTORY OF COFFEE ROASTING EQUIPMENT

(THE EXPURGATED VERSION)

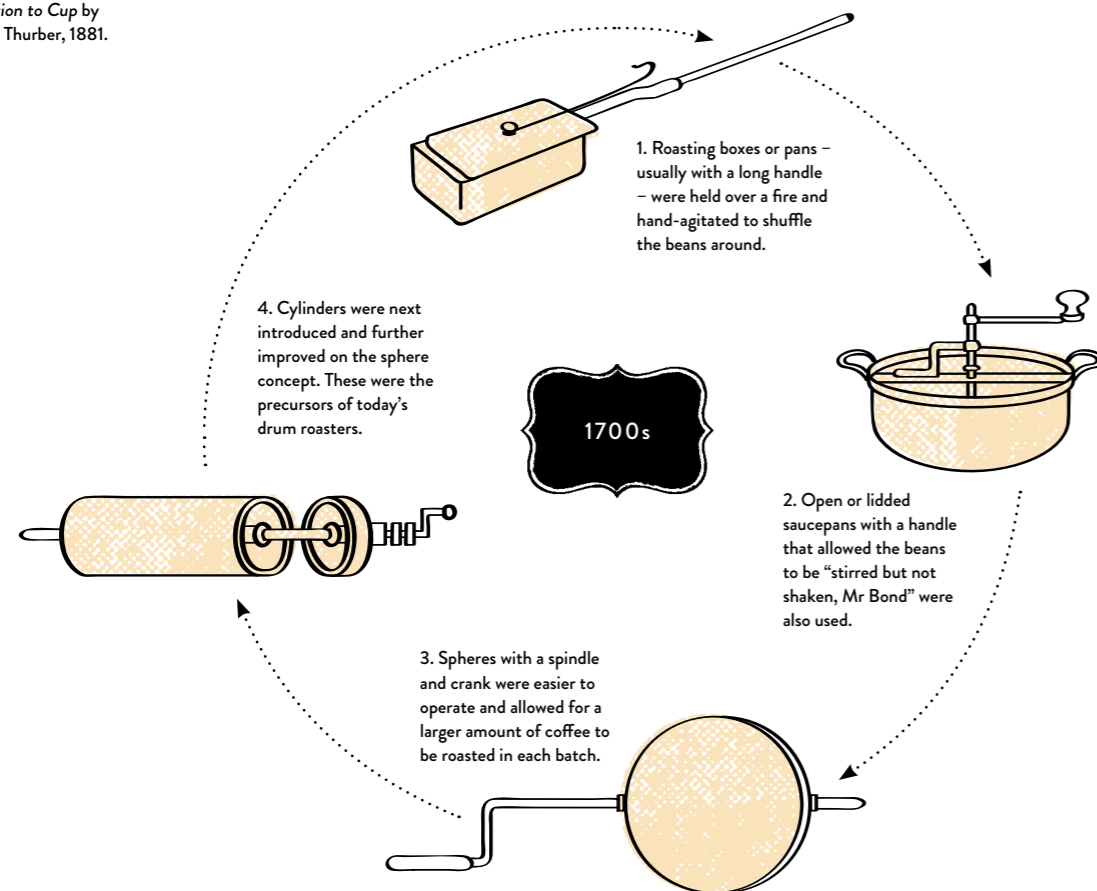
In 1881 a gentleman by the name of Francis Thurber wrote one of the first extensive books on coffee called *Coffee: From Plantation to Cup*. He made a very important observation that: "The finest quality of coffee (bean) unskilfully roasted will give you a less satisfactory result in the cup than a poor quality (bean) roasted in the best manner". This is an important observation as it placed focus on technology and the skill of the master roaster in the quality of the final product in the cup.



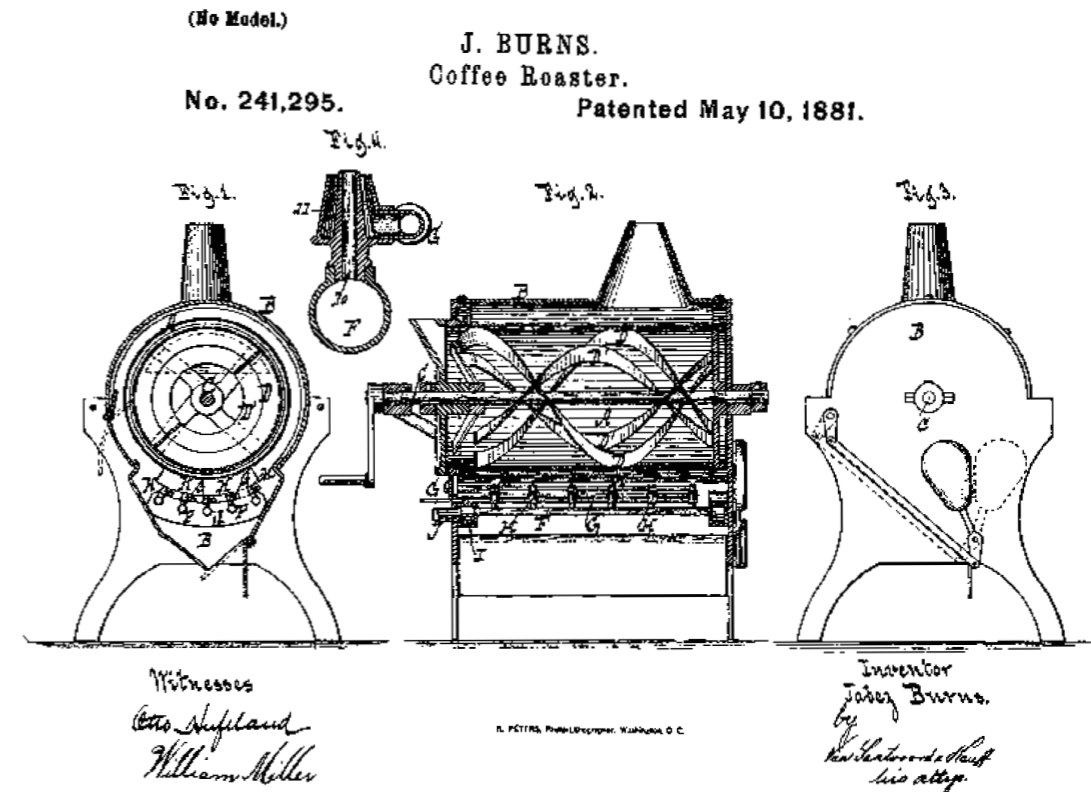
Coffee: From Plantation to Cup by Francis Thurber, 1881.

So let me give you a very brief rundown from the 1700s.

From the 1700s until the mid-1800s various hand-held contraptions made of sheet metal, brass, copper or cast iron were used to roast coffee beans over a direct heat source (like wood fire, coal, coke). These various contraptions included:



Burns Coffee Roaster 1881 Patent Drawing.



A big breakthrough came in 1864 when a 20-year-old gentleman by the name of Jabez Burns of New York, invented and then in 1881 patented in the USA what we now know today as an early version of the modern drum roaster.

The mid-1800s saw a rapid advance in coffee roasting technology. The industrial revolution changed everyone’s focus to inventing machines that would produce a better quality product and in larger amounts – that is, the idea of economies of scale was invented.

One of the first significant machines of note was by a very clever Bostonian gent called Mr James Carter. In 1846 he patented a cylindrical pull-out roaster. This advance brought roasting times down from 60 minutes on average to about 40 minutes for a 6–9kg roast batch. It was still an imprecise, messy and dangerous art for the poor master roaster of the day, as when the coffee was ready, the cylinder had to be pulled out by two men and the roasted coffee dumped on the floor, where it was then sprinkled with water to try to cool it down.



J. Burns Coffee Roaster.



Jabez Burns himself.

A big breakthrough came in 1864 when a 20-year-old gentleman by the name of Jabez Burns of New York invented and then in 1881 patented in the USA what we now know today as an early version of the modern drum roaster.

In 1864 Burns emerged from his workshop with a revolutionary roasting machine. Burns' masterstroke was using a turning drum with flanges inside, running in the opposite direction than in previous roasters, that acted like a corkscrew inside the drum, pushing the beans from the back to the front. Once the beans had been roasted, a door at the front was opened, allowing the beans to pour out of the drum. It was the first machine that did not have to be moved away from the fire for discharging roasted coffee. The drum could carry on turning and a new batch of beans could be loaded via a rear door. Moreover, the turning of the beans by this double screw meant that the beans moved uniformly throughout the drum and were therefore roasted more consistently.

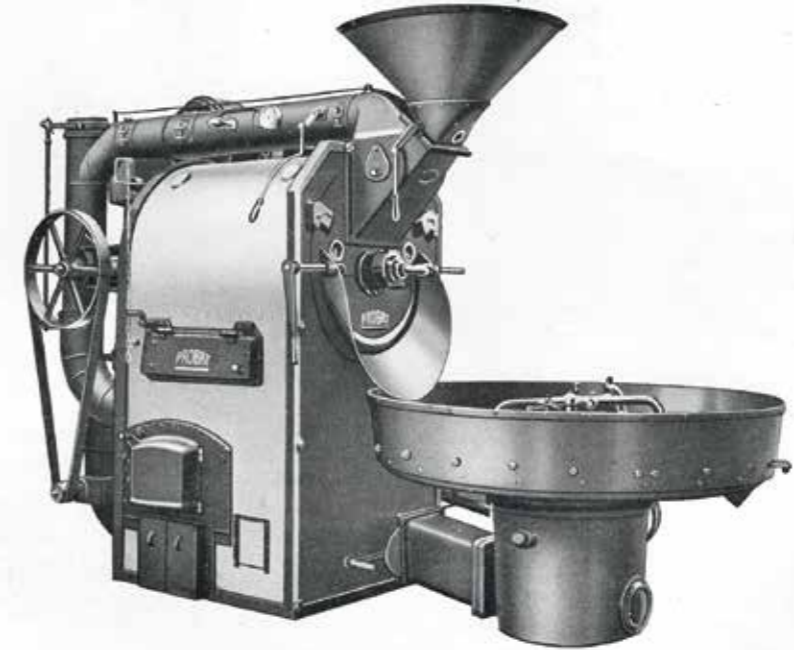
In the mid-1800s Alexius van Gülpen and his business partner Johann Heinrich Lensing teamed up with Theodor von Gimborn, a young engineer almost straight out of university who had the idea of building a foundry and machine building company and designed and engineered their first roasting machines. Together the three of them founded the Emmericher Maschinenfabrik und Eisengießerei in Emmerich in Germany's Lower Rhine region. The first coffee roaster Theodor designed was the ball or sphere roaster in 1870.

Marketed as the Globe roaster it quickly entered mass production and sold tens of thousands of units over the proceeding decades.

Technology had continued to rapidly develop and roast batch times dropped to as little as 20 minutes through innovations such as perforated drum cylinders, the move from coal and coke heat sources to gas, and special lids that allowed for more temperature control. The advent of natural gas allowed for the burners to be placed directly under the roasting bin and, with a fan, the hot air was ducted through the roasting cylinder to provide convective heat transfer.

In 1884 Probat released their patented coke-powered Schnell or Rapid Roaster model, quickly followed by a gas version in 1889. This roaster featured cased worm-wheel gearing and an external belt drive. In the later 1890s the Rapid Roaster became known as the Probat Rapid Roaster.

PROBAT Coke heated Rapid Roaster



PROBAT with stationary self-emptying cooling sieve. (Attendance at the left).

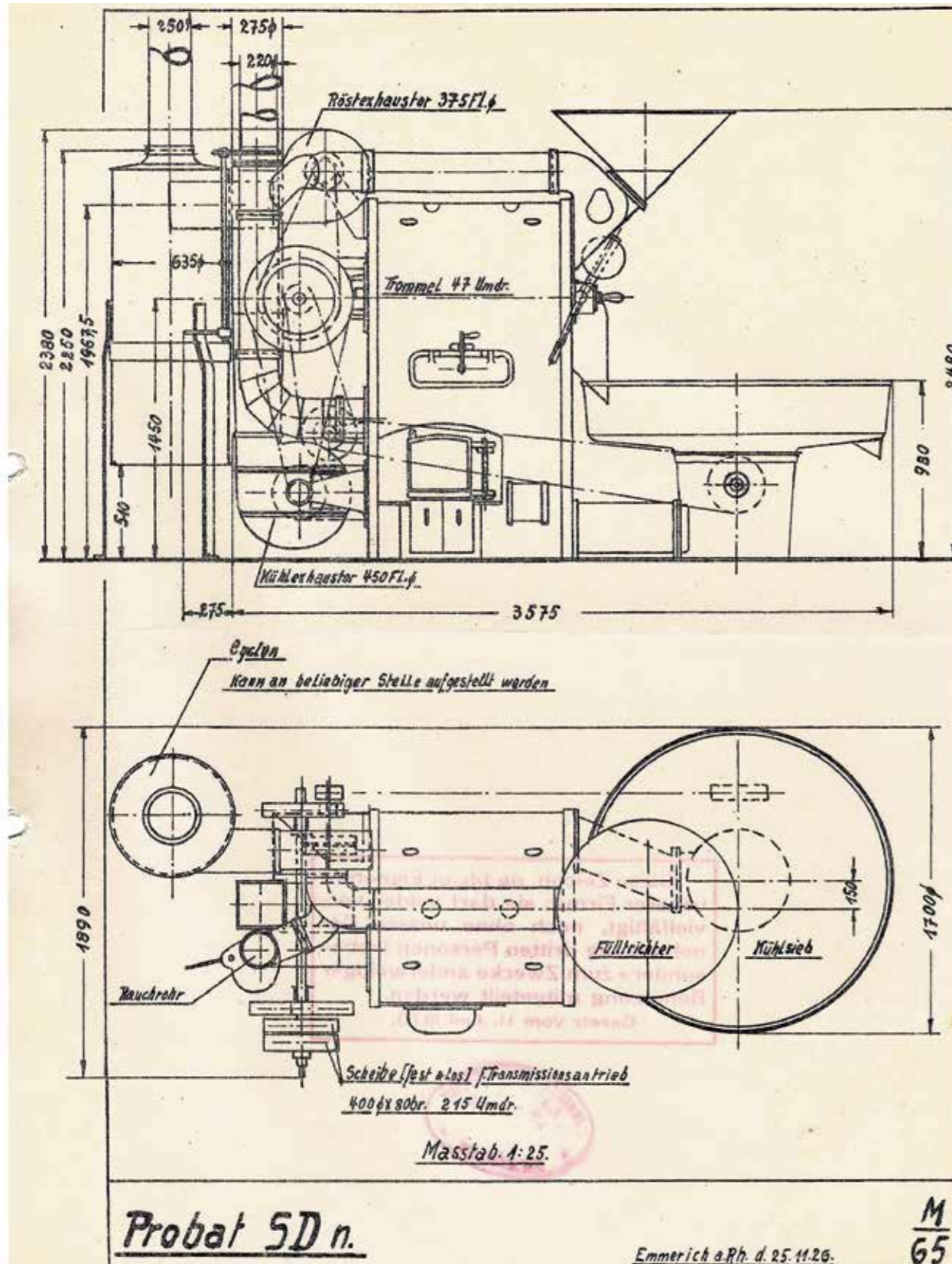
PROBAT the first Hot Air Operated Rapid Roaster

is well introduced in the market since many years. Since propagation of the **rapid roasting** process this machine marked a new epoch for rapid roasting in thousands of enterprises throughout the world. The actual style of the machine also has been kept abreast of the present state of technics.

Furnace and roasting drum have logically been placed in a common well insulated casing; under double utilization of heat the hot air enters the **unperforated drum** which has been provided for that purpose with an admission at the rear. By that means the heat is transferred direct to the coffee being

steadily shaken up. **A special roasting exhauster** evacuates the roasting fumes together with coffee membranes and any other impurities. After having crossed the **membrane catch** the roasting fumes are conducted to the chimney. The agitator arranged in the interior of the drum exposes the material to be roasted continuously and uniformly to the current of hot air and obtains a thorough satisfactory and homogeneous finish.

The operation of the hot air upon the material to be roasted is fully adjustable at any time. Cooling air can be supplied to the cooling drum in whatever volume.



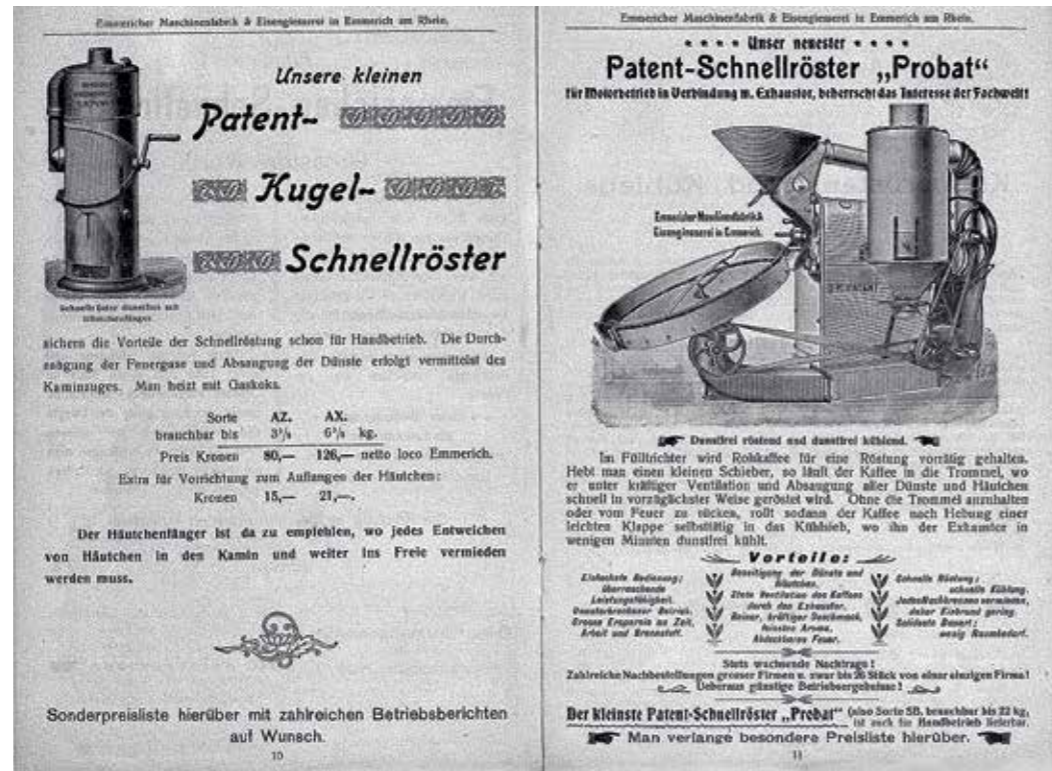
Tina von Gimborn-Abbing.

While researching this book I contacted Tina von Gimborn-Abbing, who runs the Probat Museum of Coffee Technology in Emmerich. Tina is the great-granddaughter of Probat's founder Theodor and has generously provided me with incredible archive material and pictures for this book. Tina also related the following story for me about her father trying to convince her grandfather to change the company name back in the 1950s:

“When my dad started in sales in the 1950s he would introduce himself with ‘Hello, my name is Hans, I am from the Emmericher Maschinenfabrik und Eisengießerei in Emmerich’. The secretaries at those former or new customers would look at him as if he came straight from the moon and ask ‘Who are you and how can I help you?’ ‘I would like to sell you a Probat coffee roaster ...’ ‘Ah you are Probat, come in, we have been waiting for you!’ That really happened! Back home he began a discussion with his father Carl on the name change of the company; it took several years to convince Carl to change the company name to Probat-Werke. In 1959 my dad won the battle and since then we have been called Probat - the word Probat deriving from Latin as “tested and proven”. Well the testing and the proving still goes on and I hope for much longer.”

TINA VON GIMBORN-ABBING
MUSEUM FÜR KAFFEETECHNIK

Left: Technical drawing of the Probat Rapid drum roaster from 1925.



Probat Rapid Roaster catalogue from the late 1920s.

Recent advances in technology have moved us towards computer-controlled roast profiling automation. This has undoubtedly improved the quality, consistency, and safety around the art of coffee roasting for modern roasters.

PROBAT COFFEE ROASTERS THROUGH THE AGES



1879 Ball or spheric roaster first generation AZ 3kg per batch.



1900 25kg Rapid Roaster operated until 1981.



1930 45kg G45 Probat Roaster.

In the early 1900s both Probat and Burns continued to bring roast times on their roaster models down to as low as 16 minutes. From an economy-of-scale point of view, this allowed master roasters to now produce around three batches of coffee per hour. The Burns Jubilee roaster had a 2–4 bag batch size (120–240kg). These roasters by now looked and operated pretty much like the modern drum roasters of today.

Importantly, other technologies improved, such as cooling trays which went from the aforementioned floor-based dumping, to troughs using rake-like wooden implements to move and cool the coffee, to the cooling sieves and trays with paddle rotation equipment powered by motors and fans that we still see today.

Recent advances in technology have moved us towards computer-controlled roast profiling automation. This has undoubtedly improved quality, consistency and safety around the art of coffee roasting for modern roasters. Oxidiser technologies and hot air recycling are also helping us save money by reducing fuel use, while also helping the environment by reducing emissions levels into the atmosphere.

Finally I will also briefly mention some other non-drum roasting technologies that developed during the 20th Century. My focus in this book is on drum roasters because that's what I know, but these inventions have been important breakthroughs in coffee roasting machinery history:

1 In 1957 Antonio Scolari developed a roaster that used infra-red lamps. However, it didn't really take off in a big way.

2 In 1926 the Cassen fluid-bed (hot air) roaster was released and further developed by other companies such as Gothot.

3 In the 1970s Michael Sivetz furthered this idea and patented his fluid-bed roaster on which German manufacturer Neuhaus Neotec still base their designs today.

I will go into more detail in Part A-3 on different modern roasting technologies in the current market. So there you go, a brief history of coffee roasting equipment in 1,500 words or less!

LIVING THE DREAM!

What's the Ongoing Attraction of Roasting Coffee?

Roasted coffee is a sexy beast. That satin-brown bean colour, the incredible aroma ... and the flavour is undeniable. Chocolate admittedly runs a close second, but you need half a tonne of sugar added to it to make it palatable. The analogy between sex and coffee is not a coincidence. Both are very popular because they make you feel good and both are, because of this very fact, very big business.

What initially attracted me to roasting coffee was how natural a process it was. Simply add heat at the correct rate and time, and around fifteen minutes later – voila, it's done! No added ingredients, artificial colours or flavourings! The green side of coffee production was also still a very natural process, although granted, the washed-coffee process can be rather water intensive. Decaffeinated coffee is another story, but more on that in Part B.

I also liked the blend of art and science in coffee roasting. You need to be in tune with both sides of this equation. The trend of late has been to focus on the science side, with the onset of data-logging software and profile roasting semi/fully automated roasting machines. I sincerely believe that this technology has helped with consistency and quality. I do, however, feel that good master roasters also need to have a feel for the roasting process itself. This is the art side, and one I believe is crucial to acquire, especially as an artisan roaster.

Younger master roasters appear obsessed with the science, and I guess it's a natural side effect of the geek culture/connected society of today. However, all the science in the world won't get around the natural variation in the green beans that you will encounter on a day-to-day basis. For this you need feel. This can't be taught with a textbook. It only comes with experience, mentoring and time. This is what I grew to love about becoming a master roaster.

If you love cooking and its various techniques (like applying the correct heat at the right times) and you love describing flavours, you will become a good master roaster. To me, when you post-blend different origins, you are creating a new dish, a new flavour for your customers to enjoy. Their positive feedback makes you feel good. This is the reward and the reason for taking up coffee roasting for a living. Financial reward will come if you consistently offer the best product you can for your customers. Without a good product you have no business. Marketing alone won't help you.

The coffee industry is a tough and competitive business, but it's also very rewarding. The culture bred by the third wave of roasters in recent years is one of collaboration and sharing, unlike the closed industry I encountered 20 years ago. This is a good thing and why I am also sharing my knowledge with you in this book.

My last tip here is to say this. Become an artisan coffee roaster only if you think you will love it and are willing to put in the time and effort. This will help you get through the highs and the lows, making it all worthwhile in the end – and then you too can live the dream!

