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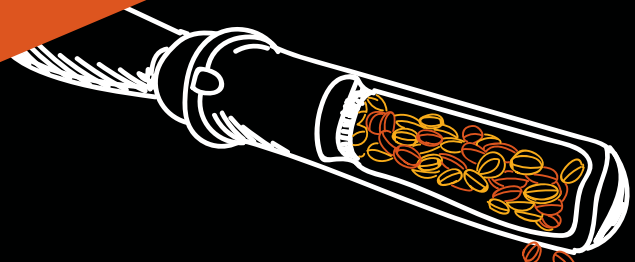

RAIMOND FEIL

COFFEE ROASTING

MADE SIMPLE

A GUIDE THROUGH
PHILOSOPHY, PRINCIPLES, RECIPES
PROFILING, SAMPLE ROASTING
& EVERYTHING IN BETWEEN

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Full Book ISBN: 978-9949-88-582-4

www.coffeeroastingbook.com

Practical advice of 12 years roasting experience made simple to accelerate your learning in coffee roasting

Although this book is also intended for beginners, I still assume that the reader has at least some kind of basic idea and understanding about coffee roasting. Therefore, I haven't covered beginner ABC details.

In this book, I'm going to talk about practical hands-on coffee roasting. I will discuss profiling and how to profile sample roast, how to avoid over- and under-roasting, how different variables in roasting change flavours in the final cup and the principles that govern the roasting process. I will share and review all my philosophies and ideas that became fundamental for my practices and that formed my way of roasting; and a lot more.

I'm going to give you all the necessary tools so you can successfully develop your own roasting profiles and edit the ones I present here. The same tools will help you to become a better, smarter, and more consistent coffee roaster.

This practical handbook is a collection of my experience, knowledge, thoughts, and beliefs on coffee roasting I have been discovering and figuring out during the 12 years I have worked in the Specialty Coffee industry.

With this book, I want to make every new coming coffee roaster's life easier, help baristas to gain knowledge on roasting when they have so little access to information but are seeking it, provide tools and knowledge to beginner coffee roasters and roasting entrepreneurs so they could make better tasting coffee sooner and have less struggles with product development. Also, I believe that many already professionals will find something new from the pages of this book to think about. I hope this book will find its way to many coffee farmers and help them with knowhow on roasting and thus make it possible for them to roast their own coffees with precision and understanding to accelerate the improvement of their coffee growing, processing skills and techniques. I believe this book will accelerate anyone's learning curve and give deeper understanding of coffee roasting.

WHY WOULD YOU TAKE MY KNOWLEDGE AND EXPERIENCE SERIOUSLY ENOUGH?

I have been working in the coffee industry for 12 years and been lucky to spend almost all of that time with specialty coffees.

My route in the coffee industry has been similar to many other coffee professionals out there. Starting as a waiter, I then became a barista in the usual random way. Suddenly, I was hit by a whole new world, the coffee world, and got carried away with it as a hobby. Without hiding my interest for the subject, I really got into it to the point I received an offer from the owner of the coffee shops I worked for to become a coffee roaster.

In 2005, I had become the first specialty coffee roaster in the whole of Estonia. The coffee shop I was working then had 4–5 other shops, so we decided that it would be a great idea if I started training all the baristas and created uniform know-how for all our staff too. I had become officially Coffee Roaster and Coffee Trainer.

In 2006, I participated in the local official Barista Championship where I finished 6th. As I was pretty hard on myself, I never went back to the competition as I was afraid of failure. Well, probably I failed even more with that decision. So don't make that same mistake if you are really after growth, knowledge and becoming a better person and coffee pro!

In 2007, two coffee guys offered me to join their team in creating a new coffee roasting company which sounded like an upgrade for me. I was responsible for developing the full training program and managing everything to do with production. 6 months after I joined the new team, we got our Probat L12 running and the first greens roasting. I spent around 5 years in (then) Gourmet Coffee (Coffee People now), roasting and training and trying to figure out the intricacies of roasting. At one point I finally bumped into a hypothesis that helped to get the puzzle

together on how roasting's different variables could be connected to the taste development in the cup. I tested the ideas many times back and forth so as to be convinced of their reliability, and fortunately, they worked. I also developed my philosophy of roasting at that time.

After 5 years at Gourmet Coffee Roastery, I had the opportunity to start another roastery with partners from Latvia. This was something for me, as I become a co-owner.

After 2.5 years of preparation and struggles with bureaucracy, we finally managed to open the doors of Rocket Bean Roastery (and a Coffee Shop) in April of 2015. One year after opening, I decided to leave the company. I had worked there with the guys for 3.5 years, teaching everyone about specialty coffee and developing full scale production from greens buying to quality control. I was in charge of everything to do with coffee in that company.

Now, 2.5 years later I have written and published a manual on what I know best, coffee roasting.

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INTRODUCTION

Around 12 years ago if a barista wanted to get really high-end knowledge about espresso brewing and other brewing methods, they had to pay for training classes from cool, badass and expensive coffee dudes and gurus like Tim Wendelboe, Frits Storm, Troels Overdal Poulsen and other coffee geniuses. At the time, everything to do with coffee roasting was rather a secret for every roaster. Almost no one even mentioned the simplest things like the length of their roasts back then.

12 years ago, there were only a handful of specialty coffee shops around even in the big metropolitan cities, not to mention medium cities or towns where there were mostly none. I remember visiting London in 2006, and there were maybe 4 or 5 specialty coffee shops. But somewhere on the road to today, a change, a big change occurred. Suddenly, everywhere in the world specialty coffee shops started to appear almost in every city. Today you can find them nearly on every corner in big cities and definitely you have a choice to pick from in smaller cities and even towns in most of the world. What has triggered that? Could it be that the free access to knowledge played a part in it as well? I believe that to some extent it definitely did. At some point, espresso and other manual brewing knowledge weren't that secret anymore. Suddenly everyone started to discuss the topic openly and share their knowledge and experience. All the tips and tricks were available to everyone. Blogs, forums, Youtube, and even Google got filled with all this information. Today you'll even find that a lot of coffee shops share their brewing recipes for free on nicely designed cards and on their web-sites. When people started sharing their knowledge freely, I believe, this was the point that triggered the industry development acceleration. It created transparency and growth. Now, 12 years later all that super-secret brewing knowledge is no longer super-secret. It has become absolutely free and something that is the basis for growth, development, and innovation.

Today, the industry has started to talk about roasting curves and profiles more than ever. But nobody still talks freely about the details that make the real difference. People are still somehow defending their knowledge of roasting—"yeah, I can talk to you about my profile... (not really)"—you probably experienced these slightly awkward discussions about roasting where everybody wants to be a cool sharer but all those involved can still sense they're protecting the secret that makes them better than the rest of us. Although the roasting side of the industry has experienced huge growth, I believe it can still be improved.

There are a number of books, articles, blog posts, and writings about coffee in general, coffee's origins, brewing, coffee plants, coffee varietals, botanics, on how to open a coffee shop, etc. But there are only a few books on coffee roasting, and these too give only some basics and directions or get overly deeply into chemistry that really doesn't help beginners and roasting much, to be honest.

Two and a half years ago when I left my last coffee company, I wasn't sure if I'd ever get back to roasting and coffee at all. It looked like my life had reached the point of making a 180-degree turn to somewhere else. It's all natural. This happens to many professionals in any field and industry all around the world. Even in the coffee industry, we have plenty of people who have gotten into coffee after working a decade or so and becoming real good professionals in other industries. But shortly after I left the company, I stumbled upon a thought—"it would be pretty stupid to trash all of my experience and knowledge on coffee roasting I have gathered during the 12 years I have spent in coffee." So, I decided I'd record all of that and publish it, share it with everyone who is interested in the topic, be it a professional coffee roaster, a home roaster, a barista, coffee enthusiast, coffee farmer or just someone who is curious about the topic and wonders about how to roast coffee well.

CHAPTER ONE

APPROACH TO ROASTING: PHILOSOPHY AND THE PRINCIPLE

YOUR ROASTING PHILOSOPHY DETERMINES HOW YOU DO IT, AND WHERE YOU'LL END UP

Once I participated in a blind cup tasting session in one of the well-known UK roasteries. I had brought my sample roasted coffees to put besides their roasts as it's always interesting to know how your roasts compare to other roasts and hear what others think of your stuff. During the tasting session, I asked them out of curiosity what their roasting philosophy was. The guys were a bit stunned by the question and told that they didn't really know they had one or maybe that they were looking for fruitiness in coffee. I thought to myself: c'mon—every coffee is fruity in its own way. They are fruity even if they're bit over- or under-roasted. When they lack aftertaste or are astringent, they can still be fruity. I was thinking—how can they know how to hit the nail on the head, flavor wise, if they don't have a clear vision of what exactly they are looking for? Maybe I was just misinformed. But either way, we want to have a clear idea of what we do and don't want regarding taste in our coffee.

Knowing what you want to have present in the final roasts helps you to more efficiently shape the taste profile and make smarter decisions during the roast profile development. Having a clear idea about what taste characteristics you don't want to have in your roasts will help you figure out what causes these unwilling characteristics and thus you'll be able to bypass them with more ease. So, you want to be clear about the specifics like aftertaste, complexity, balance, juiciness, fullness, roundness, under-development, over-development, astringency, bitterness, etc.—where they stand for you in your roast taste descriptions and in what quantities. Roasting philosophy is your personal roasting rule that help to guide you to your true flavor development goal.

Basically, in short:
Know exactly what you are looking for in your coffee.

- How do you want your coffee to taste like?
- What are the characteristics you want to find there?
- What characteristics you don't want to find there?

The better and clearer you can answer these questions, the higher is the probability you will end up nailing your goal. These three questions will help you to develop your approach and the philosophy of your roasting.

If you lack a roasting philosophy, you'll end up everywhere on the profile map and it's going to be challenging to nail your taste attributes. You will never be sure if that's the best you can get out of your coffee or if there are other ways to open the flavors even further.

When you trace fruitiness in your coffees, all your coffees will taste fruity, even the Brazils that are more creamy, chocolaty and nutty by nature. When you trace acidity in your coffees, they will end up being acidic and sharp. When you just want your coffees to be light roasted I bet they will, but their taste will most probably be under-developed with blunt unpleasant acidity and limited sweetness. Of course, if that's what you want then sure, go for it.

If you feel that you keep banging your head against the invisible wall of not getting the roasts right although you kind of are doing everything correct, change the way you approach the whole roasting process. Change your fundamentals, perspective, and philosophy. Or, if you don't have one, create it. The more precise the formulation of your roasting philosophy, the easier it will be to find the way to your taste development goal.

Your roasting philosophy determines how you roast your coffee!
It's a fundamental of what you build your roasting on
and a road map that helps to reach your goals.

THE ROASTING PHILOSOPHY

This is what I am looking for in my roasted coffees:

A natural balance and full potential of all taste attributes
that have been encoded by nature
into every coffee bean.

The roasting process is not a manipulation tool to change
but a means to open up the existing balance and potential
of every particular coffee bean.

So what do I mean by *encoded by nature*:

- coffee variety
- coffee's growing environment
- processing

or all the processes that precede roasting and that shape the taste of the coffee.

What I mean by *natural balance and full potential of all taste attributes* I'll explain with the next example.

Imagine a strawberry.
Imagine it super ripe.
At the very peak of its ripeness.
You can recognize this very special point of ripeness
by smell and touch already.

Now...
Imagine biting that super bright red strawberry
Can you feel how it explodes in your mouth?
How your mouth waters, in an instant.
How these tiny droplets of red juice sprinkle all over your palette and the scent is drawn from the mouth into your nasal cavity when you chew?
Can you feel it?
The aroma...
The texture...
The symphony of that marriage of sweetness and acidity.
That mind-blowing juiciness.
It's all over the place.
That fullness of mouth feel.
And the taste that lingers for a while on your palette, although there is no more strawberry in your mouth.
Maybe you didn't even notice when you swallowed the flesh of that berry as it was so perfectly balanced in taste.
And you really want some more!
Maybe you even reached for another berry without noticing already?

Now....
Imagine a peach.
Super ripe peach.
At the very peak of its ripeness.

We can go on and on and on, forever...

I don't believe anyone has ever tasted super ripe fruit that is unbalanced and tastes ugly, except maybe when one doesn't like a particular fruit. I have not yet met one human being who has said that they don't like ripe fruits or berries and instead prefers over-ripe or under-ripe fruit. Except bananas, which are the weird exception where some people like them almost green and some all the way brown.

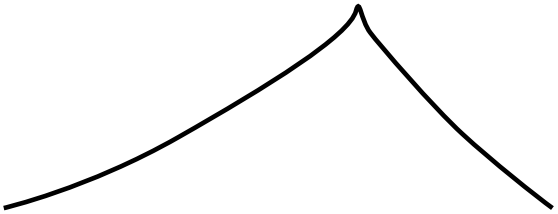
Coffee is a berry too. I believe the same principle applies to coffee roasting. It's like ripening that berry. When I roast my coffee, I want it to taste the most balanced it can be. For me, balanced means that super-ripe point of the previously mentioned strawberry, where the sweetness is married to acidity so it becomes a single sensation—juiciness.

When coffee is balanced, its taste attributes become juicy, round, full, long lasting, and fill the palette from front to back. Even the aftertaste will linger on and on. This is due to the sugars and acids reacting and vibrating in our sensory system when they're spot on. Everything just falls into place by itself. But as soon as you move away even a bit to one or other direction, for example with your profile length, you are breaking that balance. This, in turn, creates flawed sensory results in view of roundness, fullness, juiciness, long lasting flavor and complexity.

(Sweetness + acidity =) juiciness, complexity, aroma, taste at the front of the palette, taste at the back of the palette, long and pleasant aftertaste—if any of the given taste attributes are off, the profile needs to be adjusted until they aren't. Only after that, I start focusing on the individual taste nuances of the coffee. I don't worry whether the taste nuances are or are not going to be present after the overall taste balance is established. They are always going to be there if the overall balance is spot on; and they are always going to be the boldest they can be the way they are encoded into any given coffee and its origin. That's just what my experience has taught me.

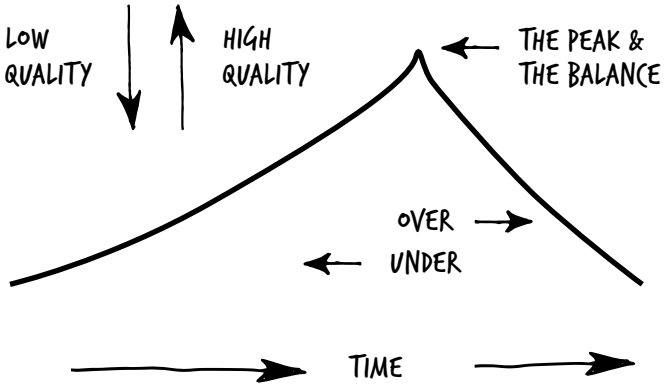
IT'S NOT ABOUT THE NUMBERS, IT'S ABOUT THE PRINCIPLES OF NATURE

PRINCIPLE OF THE NATURAL DEVELOPMENT OF NATURE



At some point on the way to figuring out how coffee works during roasting, I came across a random thought on how the roasting process affects taste development. It was a hypothesis that I started to test and wanted to confirm. Together with the hypothesis came along the tools and ways of confirming or disproving the idea. After hundreds of tests and experiments with the sample roaster and production roaster, I figured out the roasting and found that the same idea applies to coffee brewing as well. But then I didn't even realize what I had actually discovered. While writing this book, I came to the realization that the principle I had been applying to my roasting and brewing worked in a wider range. When we look around us more closely in life, any topic or area, we find that they are governed by principles. If you understand the principles, you can achieve, change and build anything you want if you put in some work. But how can I be so sure that it was a principle I had discovered? Because the principles govern a wide range of processes of similar nature, not just one as formulas do, and this is exactly what the given principle does.

The basis of the principle is this:



The line reaches from left to right on an invisible horizontal axis that represents time. Its pace is ruled by nature. The vertical axis is our olfactive perception of quality. (Olfaction is also a measuring tool created by nature.)

It describes perfectly how fruits develop in nature. First, they are under-ripe. The riper the fruits get, the better we perceive their sensory quality until it reaches the high peak of sensorial quality—balance and full development. This is the point that we call fully ripe. We can't get higher than that with the perceived quality. The fruits have reached their maximum levels of sweetness and acidity where they are maximally balanced. The speed of ripening is managed by nature. Each fruit has its own designated progression towards perfect ripening. When the process advances onwards from the fully ripened point, over-ripening occurs. The further we move from the fully ripe point the lower the perceived sensory quality gets.

Now, if we remove the fruit part from the explanation above, we can see that it describes any process that includes under-, peak and over-development. This principle also governs coffee production in its every single stage.

Look at the ripening of the coffee cherry. We all agree we want the coffee to be picked at its highest ripening point and we are all on the same page what that point would be.

Processing, for example, consists of many separate stages. Each of the separate stage works according to the same principle—they have under-, peak and over-development. Fermentation can't be neither too long nor too short. You have to nail the peak to get the quality. The pace at which fermentation happens is governed by nature again. In drying, we have to reach the certain moisture percentage between around 50–0%. We have to catch the peak that is somewhere in the center of the whole process. The pace of drying is again governed by nature. You probably did notice I didn't mention pulping or washing here because these are not individual stages of development. They are transition points where one process turns into another. They are the key points that lock in the development points of the preceding stage.

For example with storing the greens, beans can't be used for best results just after drying the coffee has been completed. Coffee needs some time to rest to get the fresh grass-like taste out of it. Also, when it gets too old the taste quality decreases. The same principle is at work again.

By nature, roasting is a similar process to processing. It consists of two main phases (first and second) and each of the phases needs to be handled separately as we do with fermentation and washing, although they are part of the same process. Each needs to have a certain length and development locking point. The first phase has a naturally occurring locking point—the beginning of cracking. The second phase gets locked with the roast end temperature and time. Also, both phases need to occur with their natural speed that has to be found.

What about the storage of roasted coffee? Again, you need to wait a few or more days before the coffee has degassed or calmed down and stabilized before you can get the max potential from that coffee. The so-called

quality peak of the roasted coffee lasts a certain length of time before it starts to decrease (though here it lasts longer than in any other process). These quality peaks are determined by the roasting process, equipment, and technology.

Grinding is the point that ends the storage process by locking in the freshness and quality of the bean and is also a point of transition for brewing (talking here strictly on the basis of the Specialty Coffee approach where coffee gets ground just before brewing).

All the same things apply to brewing. There are just far more variables we use to influence the ripening of the brew. The recipes of pour overs and espressos are guidelines on how to reach the ripest point of the brew.

Water, even its mineral and pH composition, is governed by the same principle. We can't have too high or too low mineral and pH content. Except that we do not have the same timeline here since the composition of water is influenced artificially most of the times.

Water brewing temperature. I'm not going to go into it but I hope you already see the correlation.

The recipes for brewing, the profiles for roasting, the proper techniques for processing, and protocols for harvesting are all recipes on how to reach the peak quality point of each process. It's basically all about the principle and well-timed lock-in points (which are harvesting, pulping, washing, end of drying, start of roast, first crack, end of roast, grinding, end of brewing).

The better the lock-in points are timed,
the better is the quality of the results.

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This book will give you all the necessary tools so you can successfully develop your own roasting profiles and edit the ones presented here.
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It's a condensed collection of Raimond's 12 years coffee roasting experience with Specialty Coffees.

"This book can really push beginners in the right direction as well as provide advanced roasters with new ideas and thoughts on roasting craft."
- Tomáš Nossek, Roastmaster and QC at Rebelbean.