awareness of the Netherlands as almost a piece of art – a fascinating mixture of natural elements and human skillfulness in mastering them.

After your arrival, most likely, you settle down in one of the Holland provinces, which include the larger cities of Amsterdam, The Hague and Rotterdam but also smaller ones like Haarlem, Leiden and Delft, or one of the lesser-known small places around it. Staying there, you find out that the Dutch follow the general western way of life but that they do have their own lifestyle. Besides coffee, for example, they also drink large volumes of milk all the time – not just for breakfast but even at lunch, and they also seem to like cheese a lot. They may not wear wooden shoes, as perhaps you had expected, but they do indeed ride bicycles – usually without wearing helmets. And even when there are not that many traditional windmills to be seen, after a while you do spot a few, and you also find out that tulips and many other kinds of flowers are quite affordable here.

As might be expected, several such aspects of the Dutch lifestyle are related to their watery surroundings. The milk and cheese come from the cows that are grazed on those flat grassy fields; the subsoil is actually so wet that not much else would grow there. The bikes, in turn, make sense as a means of transport in a flat country where distances are short. [05, 06] The wooden shoes are indeed mostly out of use now, despite the fact that they are waterproof and insulating, and thus a clever solution for farmers working the wet and often cold land. The windmills, obviously, were the old-time pumping devices for keeping such low land more or less dry.

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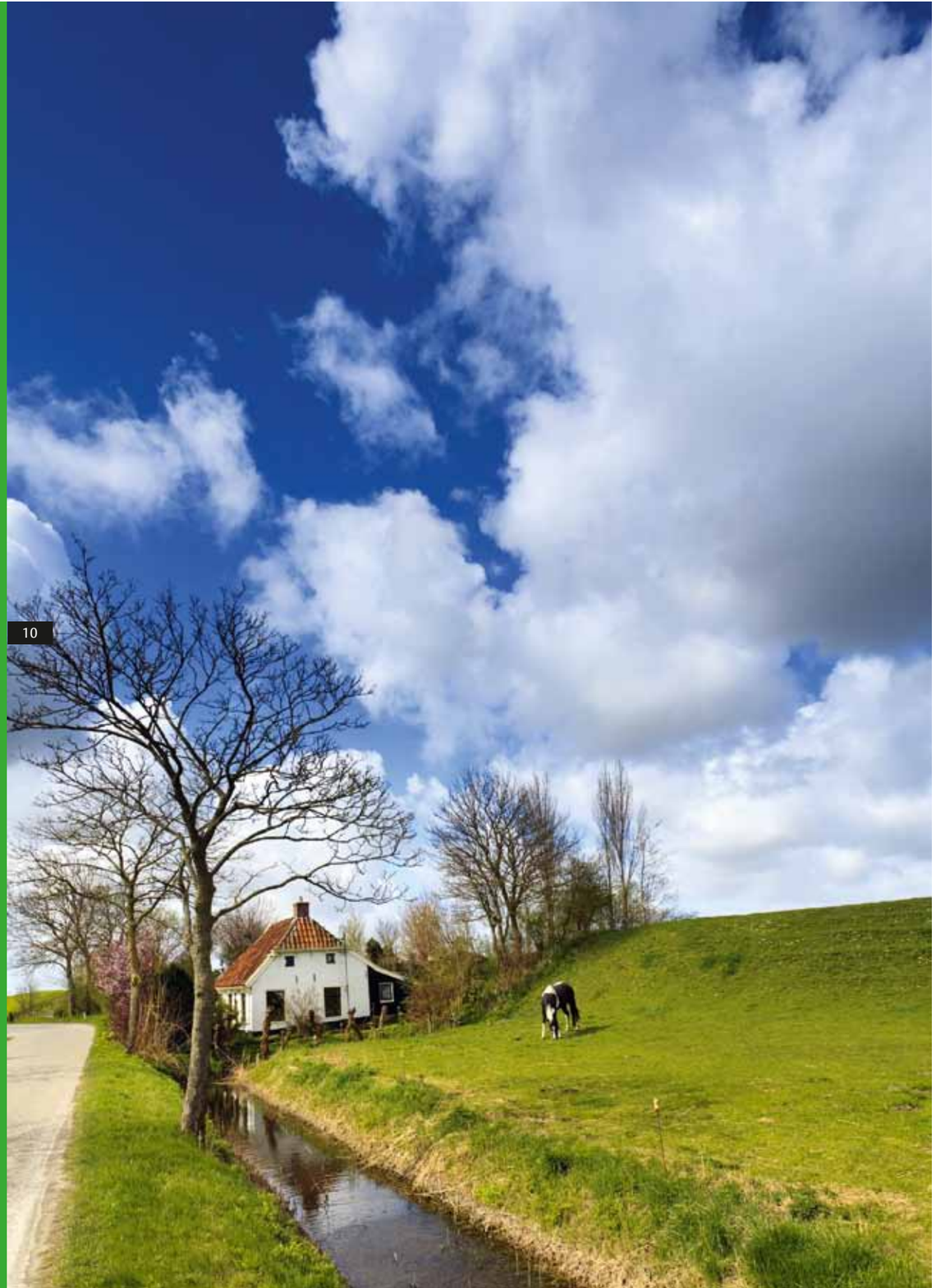
Holland and the Netherlands

A Noord-Holland province (North Holland)
B Zuid-Holland province (South Holland)
A + B = Holland

1 Amsterdam
2 Den Haag (The Hague)
3 Rotterdam



would be flooded; bad enough, but in most cases not catastrophic. (Later on we will see where it *would* be catastrophic…) It all depends, then, on what kind of dike it is – large or small, near the sea or inland, and which altitude or 'lowitude', if you will, is behind it. Most likely, and fortunately, you will never have the occasion to know what would happen if the dikes in your area would break! But if for some reason, in a highly unlikely and truly cataclysmic event, all dikes would break simultaneously, roughly one half of the Netherlands would be flooded. A major tsunami in the Atlantic – which would then certainly not be restricted to the Netherlands! – might reach the +2-meters (6.5 ft) line roughly stretching from Holland's southwest to the northeast, from Bergen op Zoom to Groningen, leaving only some small islands here and there.

Question: "How do I know if my own house is below sea level, and if so, how much?"

Good point. Until recently, it was quite hard to find out. Even today, most Dutch people don't know, and what's more, the government-employed 'water engineers' don't really seem to care all that much, although the municipalities are, of course, kept on alert. (Even Crown Prince Willem Alexander is officially into 'water management'.) With the Internet, however, there is a way of knowing how low (or better yet, how high) your house or hotel stands. On the website ahn.nl/postcodetool[4], simply type in your zip code (*postcode*) without leaving any space between numbers and letters, and you'll find your answer. The surrounding text is in Dutch, but you will understand the numbers (they are in meters). But are you sure you really *want* to know…?

Generally speaking, the lowest elevation of all is the Rotterdam/Gouda area, where towns like Capelle, Nieuwerkerk and Krimpen are as low as some -5 meters (-16 ft). The absolute national minimum lies in the area called Zuidplaspolder, near the town of Nieuwerkerk aan de IJssel, at -6.76 meters (-22.18 ft). The actual spot is in an inaccessible field, but you can find a monument to 'honor' this fact at the entrance of a nearby truck company. Given the soft soil of the country – which allows very slow movements – the lowest place may actually move away from this spot in years to come. (The monument data is already a bit incorrect, stating that it is -6.74 (-22.12 ft). Lower places certainly do exist on the planet, but those were not made by people!

Other areas in the country are somewhat higher up. Downtown Amsterdam, for instance, lies some two meters (6.5 ft) *above* sea level, but newer suburbs are lower again. When staying in The Hague area, your place will probably be a few more meters above sea level even, but the eastern half of the city and suburbs like Zoetermeer are lower again. Residing in the woody area around Hilversum, you probably find yourself on sandy, higher grounds altogether. [11]

There is a map on the Internet showing you the lows and highs of the Netherlands in great detail, but you need another map with place names on it to find your exact location. [12]

4 All websites mentioned in this book should be preceded by http://www, unless otherwise stated.

The Netherlands in Roman times (100 AD)

1 Utrecht / Trajectum
2 Nijmegen / Noviomagus
3 Maastricht / Mosam
4 Voorburg / Forum Hadriani
5 Insula Batavorum
A Former Zuiderzee / Lacus Flevo

... Northern border of the Roman Empire, coinciding with northern border of the Rhine

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where life was slightly easier than elsewhere in their wet habitat: along the rivers. In low land, rivers create their own embankments. During flooding, sand, clay and gravel transported from upstream areas are deposited, creating natural levees on the shores. With different weight and density, these banks of material are sturdier, drier and also more fertile than the marshland behind it. People had already been living in the drier east of the country thousands of years earlier, but archeological findings from the western river land indicate that by 5,000 BC some people had also settled in the wetlands near the coast [64]. They put up simple huts on top of the river levees, mostly living off cattle-breeding and fishing. The higher grounds also allowed simple agriculture. In a way these river levees were like early, nature-made versions of the dikes that were constructed there much later, by people probably sharing some DNA with those first settlers... Even today, housing can be found almost on top[1] of the river dikes, and dikes are still used for cattle-grazing. In our day, however, such rustic and romantic old dike houses are also desirable to city people, as second homes or for retiring in the countryside, so the agricultural use is dwindling.

When the Romans arrived to these lands and made the river Rhine their northern border, they didn't exactly fall in love with the land and its climate. Probably based on stories from soldiers returning home, one Roman author described 'Germania Inferior', or Lower Germany, like this: "Twice a day the ocean throws itself on the land in gigantic waves so that one wonders if the soil belongs to the land or to the sea. On the hills, or rather on their handmade elevations, lives an unhappy population. At high tide they are like crew members, while at low tide they seem to be shipwrecked, picking up fish that want to escape with the retreating water [65]." Others complained of rain and fog – some things indeed don't really change... The Romans did however respect the inhabitants, whom they called 'the Batavi', describing them as brave and noble. They added that these people lived on 'Insula Batavorum', the 'island' wedged between the rivers west of the Roman regional capital of Noviomagus, the present city of Nijmegen [62, 63].

Roman waterworks

The Romans themselves started working on the waters of this colder part of their empire. Probably to improve drainage behind the dunes and to connect rivers, they had a canal dug from the then Rhine riverbed near present-day Leiden south to another natural river, the Schie, west of modern Rotterdam. The canal, then called 'Corbulo's Canal', probably silted up later but was repaired in the Middle Ages. Its course still exists just east of The Hague and is now called 'Vliet'. The Romans used their canal also as a transport route, since nearby ports connected overseas to Britain. The regional trading town of those days, Forum Hadriani, is now Voorburg, near The Hague.

1 For safety reasons, building truly *on top of* the dikes is not allowed, but older houses can still be seen leaning against river dikes.

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reinforcing its safety. If the experiment succeeds, it may be applied in other places. Foreign interest has also been reported by Rijkswaterstaat and other parties involved.

Speaking of international dimensions, the Dutch are actively involved – both at government level and commercially – in many other countries' issues with the sea. Every year, the highly specialized Delft University of Technology educates over 1,000 international students in hydrology and water-related subjects. Dutch companies sell their manifold services – water management, dredging, land reclamation, ground survey, infrastructural and environmental projects, construction of harbors, airports and tunnels, salvage operations and much more – all around the world. As such, the Dutch were involved in the construction of Hong Kong's new airport in the 1990s and the causeway from Bahrein to Saudi Arabia (1980s). Today they build harbors, dredge rivers and apply Dutch water technology in solving flood problems in countries ranging from the USA (Katrina) to Egypt, Pakistan and Bangladesh. Currently, Dutch engineering firms are building a tunnel between Hong Kong and mainland China, and a storm surge barrier in South Korea. Technical advisors serve as water management consultants on low islands such as the Maldives, which are equally challenged by rising sea levels. One Dutch engineer has been successful with his 'floating islands' design for the Maldive capital of Malé, which threatens to be flooded.

Closer to home, the baseline remains the same: keeping our delta dry and safe. Most of the projects described in this book are the work of many generations of people, slowly built up from previous know-how in an almost endless process of trial and error – the errors mostly demonstrated when it was too late. The final result is that flood protection and a comfortable life in general have been safeguarded on a national territory about one-third larger than it would have been otherwise, because this is what the Netherlands would look like if we had *not* done all these things, or if we had simply abandoned it all...

Without all the interventions described in this book, a third of the country would totally disappear under water or return to brackish waters, marshy woodland, and thick and soggy peat parcels – the situation of 2,000 years ago, more or less. It would be wonderful for natural diversity, of course – a haven for all kinds of plants, birds and small wildlife – but not many more than a few thousand people would be able to carve out a meager existence from its produce.

In this book you have read how the Netherlands has a history behind it of at least 2,000 years of interventions, improvisations, adjustments and compromise in its relation to water. The country will never be 'finished'; the challenge will never stop. Whether they like it or not, the Dutch are condemned to continuing the path their forefathers started on. A new generation of water engineers is in the making, but existing skills *must* be maintained and further developed. The wider public must remain ready to not only pay their share for this, but also to adjust their behavior – both as conscious citizens and consumers – to the needs of this watery environment and the wider demands of Mother Nature. Only then will the Dutch be able to keep on living in their preciously wrought, safe, dry and prosperous delta.