TREE STORIES

ALSO BY STEFANO MANCUSO

The Nation of Plants

The Incredible Journey of Plants

The Revolutionary Genius of Plants:
A New Understanding of Plant Intelligence and Behavior

Brilliant Green: The Surprising History
and Science of Plant Intelligence

TREE STORIES

How trees plant our world and connect our lives

Stefano Mancuso

Translated from the Italian by Gregory Conti

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To Paola and Sonia

CONTENTS

PROLOGUE

After decades of keeping community with plants, I seem to perceive their presence not only in every place on our planet but also in the stories of each and every one of us.

At first, I figured that a heightened perception of the vegetable world was the normal consequence of my sensitivity to these silent beings. And that, as happens to anyone who develops a strong taste for something, I had started to notice the object of my interest everywhere I went. Anyone who has fallen in love knows what I am talking about: that strange sensation that everything in the universe, no matter how distant or marginal, appears to be related in some way to the object of our affection. Every event, every song, the weather conditions, the stones in the sidewalk you're walking on, everything has a precise echo in your own little love story. I remember a delightful novella by Guy de

Maupassant, which I read as a young boy, about a lady who, every time she fell in love, and she did so fairly frequently, radically transformed her world by placing at the center of her own interest the profession of her new lover. She fell in love with a lawyer and spoke only of civil codes and trials; with a pharmacist the world was composed solely of medicines and drugs; with a jockey it was all horses, saddles, bridles, and reins. I am sure that each of us knows of analogous cases. It is one of the reasons why somebody who's in love is unbearable.

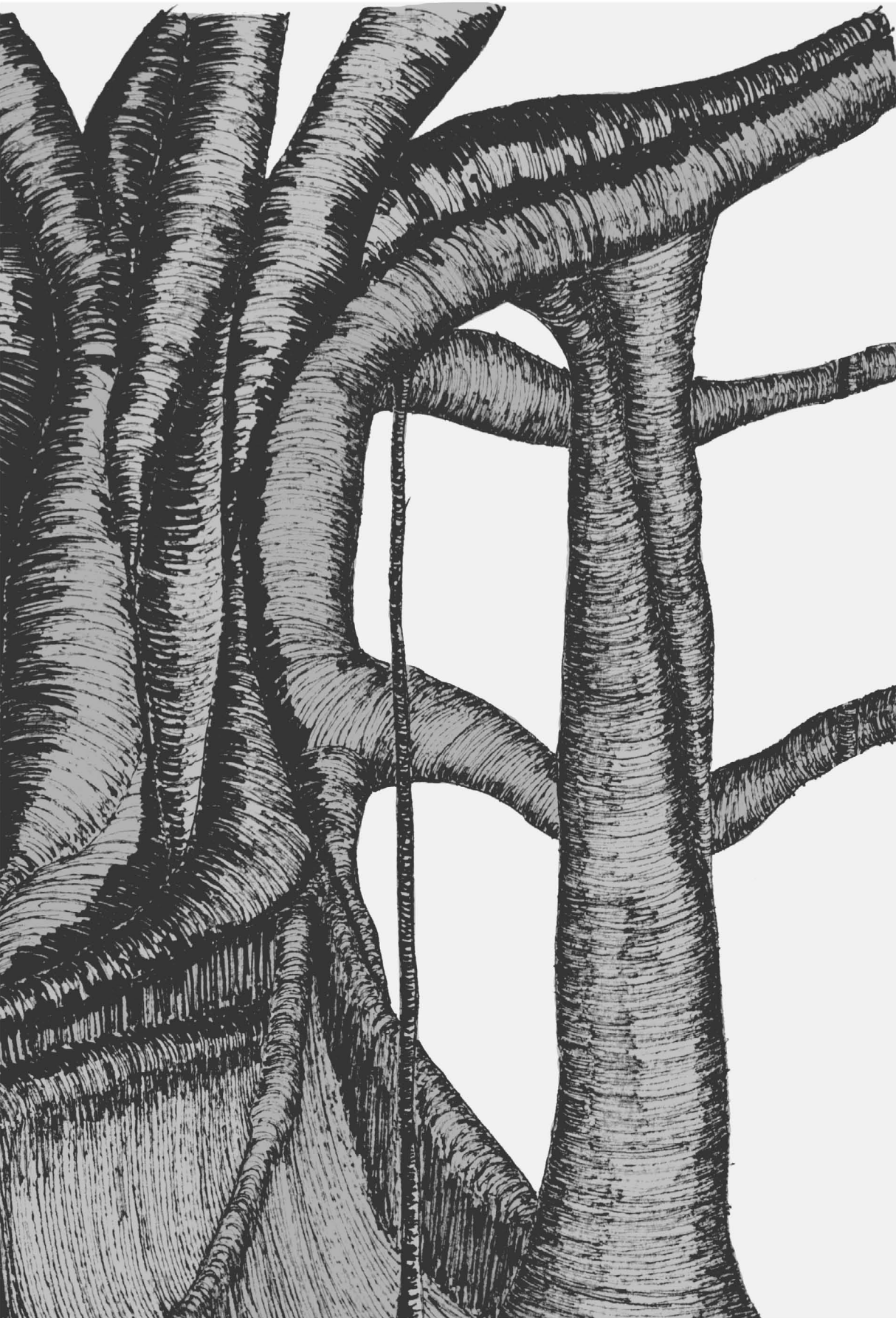
So I started asking myself if it wasn't because of some kind of green infatuation that, like the lady in Maupassant's story, I couldn't see anything except plants all around me: in every place on the planet, at the start of every human story, the basis for every event. I have thought about it and I think I can assert with a certain degree of assurance that the answer is no. I am reasonably sure of it. That I live with plants, study them, and that they are undoubtedly the center of my interests is not related to their appearance at the start of every story. It is simply a consequence of their enormous number and of their being the source of life on this planet. This is an indisputable fact. How could it be otherwise? We animals are only 0.3 percent of our planet's biomass, while plants are 85 percent. It is obvious that every story that takes place on our planet has, in one way or another, a leading role for plants. This planet is a green world; it is the planet of plants. It is not possible to tell a story about it that does not stumble across its most numerous inhabitants. That plants do not show up in our experiences or, if they happen to creep into

them, they only have a role as colorful extras, is the fruit of our total removal from our perceptive horizon of these living beings on whom all life on earth depends.

When we succeed in looking at the world without seeing it simply as a playground for humans, we cannot help but notice the ubiquity of plants. They are everywhere and their adventures inevitably intertwine with our own.

The English composer Sir Edward Elgar was once asked where his music came from. His answer was: "There is music in the air, music all around us, the world is full of it and you simply take as much as you require."[1] The same thing applies to plants. They are, like music was for Elgar, literally all around us, and to write about them, all you have to do is listen to their stories and tell them, each time using *as much as we require*.

That is how this book came to be, by taking, here and there, stories of plants that, as they intertwine with human experience, bring both together in the narration of life on earth. Just like what happens in a forest, where each tree is linked to all the others in an underground network of roots that joins them together to form a superorganism, plants are the nervous system, the map (or plan) on which the world we live is built. Not seeing this plan, failing to use it in planning our world, believing that we humans have by now placed ourselves above nature, is one of the gravest dangers to the survival of our species.



Ficus macrophylla (Moreton Bay fig). This gigantic, spectacular, apparently invulnerable tree depends for its reproduction on a single insect, the *Pleistodontes froggatti* (fig wasp), without which the figs remain unfertilized and fall prematurely.

Like liberty, it is majestic and solid, but difficult to reproduce.

One

PLANTING LIBERTY

Ever since I can remember, I have had an irresistible attraction to paper. When I was three, I fell in love with my nursery-school teacher and right after that with paper. This second passion has persisted unaltered and intact from my childhood, accompanying me since well before I started taking an interest in plants and such. One of my earliest memories of emancipation is tied to paper. To be more precise, to paper in the form of comic books.

At the time, I believed comic books came directly from the generous hands of my parents or other adult relatives, who at more or less regular intervals, and for reasons almost always related to birthdays or the achievement of some hoped-for result, bestowed on me, solely of their own volition, one of those fantastic illustrated stories. Sure, I was aware of the fact that comic books came from those places of wonder called

newsstands, those sacred structures to which only adults were admitted and so for me were as inaccessible as if they were located on Mount Olympus.

Then one day—I must have been seven—during a vacation in Rome, there appeared before me, totally out of the blue, the first secondhand comic-book stand of my life. Children the same age as me, with or without their parents, adult men and women, all allowed in to revel in the marvels of print, without discrimination of any kind. Not even income. The one hundred lire required for the purchase of a comic book (four hundred lire for five) was well within the range of my financial possibilities. In fact, I always carried with me a thousand-lire bill entrusted to me by my father "for any eventuality." I never had any idea what an "eventuality" might be before that day. I invested the thousand lire in twelve (consecutive) issues of *Comandante Mark*. It was a magic moment.

Since then, first for comic books and later for books, secondhand markets have been part of my daily life. I have followed some of them in Florence through changes of location and ownership and generations of operators, and although none of them has touched my heart like that first one in Rome, lots of other books discovered in secondhand markets around the world are indelibly impressed on my memory. Like the time at the Marché du Livre Ancien et d'Occasion George Brassens in Paris when I put my hands on a little book whose frontispiece bore the magnificent title *Essai historique et patriotique sur les arbres de la liberté*.

The market I'm talking about is one of those can't-be-missed occasions for all those who share with me the insane

passion for flea markets and used books and who live, or happen to be spending a weekend, in Paris. Every Saturday and Sunday, fifty to sixty bouquinistes come together in and around the park and market named after George Brassens, in the fourteenth arrondissement, to display their merchandise to a robust number of fanatical bibliophiles. We recognize one another immediately. It's always the same crowd, we run into each other in the same places, all desirous, weekend after weekend, to begin searching the thousands of haphazard heaps plopped on the stands of the booksellers. There are those who for years have been on the lookout for the only issue they're still missing to complete their collection of some obscure series from the turn of the twentieth century; others collect books on the most improbable topics, like coffeemakers (I actually met one such collector), Finnish history, Japanese weapons, or microorganisms of the soil.

For the most part, the crowd is made up of academics who, having studied enigmatic subjects for years, end up getting trapped in the world of their research. Okay, I'm not all that different myself, I admit. I wander around those same stalls looking for any book of any kind about plants and trees, if possible published before the start of the nineteenth century. Here, in years of assiduous rummaging, practically every Saturday morning of my adult life when I've had the good fortune to be in Paris, I have gathered an imposing collection of abstruse, forgotten, and absolutely marginal books, whose only common feature is their subject matter: plants.

The market opens to the public every Saturday at nine. This means that the truly passionate collectors are already there at eight, lying in wait. They meet in a coffee bar right in front of the market, all outfitted with enormous empty knapsacks that they hope to fill. There are embarrassed exchanges of greetings between people who have known each other by sight for years, who often know each other's names and professions, but who have never really sat down for a chat. They drink their coffee and glance at each other suspiciously, especially if they are rivals with the same interests. It's a sort of curse, whatever the subject of your search, there is always someone who is your direct competitor.

Naturally, I have my antagonist, too. He is an elderly gentleman, as tall and thin as a reed. He has a wrinkly dark complexion as though he had been left to dry for years under the desert sun, always dressed in what looks to me to be the same long, light-colored trench coat, summer or winter. Insensitive to the climate, like all good book hunters, rain or shine, snow or gale-force winds, freezing cold or stifling heat, he is always there. Every Saturday at eight. He roams the stalls with a slight limp that he uses as a weapon to conceal his ferocity. You think he's got to be slow-moving, but instead, the instant something attracts his attention, he's capable of scaling enormous piles of books with the agility of a young boy. I know this by now, but among the neophytes, his apparent fragility slays countless victims.

Fragility? He doesn't know what it is. He's as sturdy as the seasoned wood he appears to be made of. He's got stamina, too,

damn him! He never gets tired, methodically examines each and every pile, and nary a Saturday goes by that he doesn't go home with a knapsack stuffed with ponderous tomes. I once heard a bookseller call him *professeur* and another Henri. So Professor Henri was all I knew about my adversary, besides the fact that he was a terror, a real tough nut, who adores botany and the French Revolution. And that he irks me. He seems to have a sixth sense for botany books. He burrows into a pile of books like a weasel into a rabbit warren, and he always comes up with something in hand. Whenever we cross paths among the mounds, it seems like he's observing me with equal parts of disdain and amusement. We eye each other from a distance, and at the start of the day we normally head for opposite poles of the market, hunting for freshly unloaded piles, spying each other warily, hoping to be the first to find something of interest to the other. A tough life, I assure you.

It was during one of these close encounters with Professor Henri that I happened upon the famous little booklet. It was inside a plastic cover, like the ones we used when we were kids to protect our notebooks. I don't know if kids use them anymore, but when I was in elementary school, putting those covers on my notebooks at the start of the school year was something I liked a lot. For that and only that, in memory of childhood days and curious to find out what it was about, I picked up what I was convinced was no more than a notebook. I began leafing through it distractedly and, to my complete surprise, under that banal cover appeared a lovely leather binding from the late eighteenth

century. Standing next to me, Professor Henri seemed to have, like a chameleon, two independent eyes—one reserved for his own search and one constantly fixed on me to monitor what I was up to. He noticed the eighteenth-century binding and froze as though he were paralyzed. I had him in my grip. With a deceit I didn't know I was capable of, I turned the book so that only I could see the pages and continued leafing through it, leaving him to be tormented by uncertainty. When I came to the frontispiece and could finally determine what the book was about, I took my revenge. Feeling like a poker player who had just been dealt a royal flush, I faked an expression of disappointment, to the professor's delight, made a feint of throwing the book back on the pile, and then, as though changing my mind at the last minute, called out to the bookseller a lackadaisical "I'll take it," paid what I owed, and set the book aside.

Professor Henri followed my every gesture. We went on leafing through books that popped up. Every now and again, I took another look at my little book and then, with an annoyed grimace, put it back down. In the end, he took the bait. He dipped into books all around it and then, unable to contain his curiosity, asked me politely, "Excuse me, monsieur, may I take a look at the book you have just acquired?" "Oh, certainly, please, as you like." The professor leafed through it quickly, came to the frontispiece, and stared petrified at the magnificent title: *Essai historique et patriotique sur les arbres de la liberté*, authored by a certain Grégoire. The professor couldn't take his eyes off the book; he leafed through it incredulously. I allowed myself to point

out to him: "You see? It was published in the second year of the Republic, in 1794, if I'm not mistaken." I looked at him without managing not to smile. "Who knows how such an interesting book came to end up in a cover for notebooks." He was so taken aback that I regretted having been so cruel. To earn his forgiveness, and since it was the right time, I asked him if I could take him to lunch. I wanted to know something more about him. He accepted. So we headed off toward a nearby brasserie.

His full name was Henri Gerard and he was a professor of French history. I asked him to tell me some more about his passion. "I've been observing you search through books for some time now," I began, "but I thought your fancy was botany, not history. After all," I went on, "except for this last occasion in which I had more luck than you, it's been years that you've been humiliating me in the search for books on botany." That admission of his ability as a book hunter seemed to soothe, at least in part, his earlier mortification. His smile reappeared for an instant. "You're right about history and botany. They are really my two true passions." I pulled the book out of the bag at my feet. Now that I had removed the plastic cover, we could both see that it was in excellent condition. I opened it to the frontispiece. Only the author's surname was mentioned: *Par Grégoire, membre de la convention nationale* was the only indication. "Now," I replied, "you, who are an expert on the revolution, tell me something about this Grégoire, who writes about trees. Did you say he was an abbot?"

He looked at me askance. "You don't know who Henri Grégoire was, the *citizen* priest?" He was incredulous in the face

of such an enormity. "No, I've never heard of him," I replied serenely. He took the little book from me and started turning it in his hands, shaking his head. He couldn't bring himself to believe that it had ended up in the hands of someone as ignorant as me. "Well, by now it's yours and there's nothing we can do," he said with a sigh, carefully laying the book down on a corner of the table. "You should at least know something about the author of this work of which you have so undeservedly entered into possession. I hope you will understand its value. Henri Grégoire, better known as Abbé Grégoire, is absolutely one of the most important and fascinating figures of the revolution, but I had no idea that he had also written a book on the liberty trees. What's more," he added, "from the publication date he must have actually been the first to write about them." He gave me a long stare, carefully sizing me up. "If this subject really interests you as much as it interests me, why don't you come to see me at my home this week? Choose whatever day you like, we'll have a coffee and exchange information about the liberty trees. What do you say?" I accepted the invitation immediately for the next Wednesday. The professor thanked me for the lunch, gave me his address, and without waiting even for the time it took me to write it down, left me to head back to more piles of books.

I didn't follow him. I didn't feel like more rummaging through books at the market, while I was very curious to know more about the story of the liberty trees. So I decided to remain seated comfortably at the table and devote the rest of my afternoon to reading my Henri Grégoire.

Page after page he unveiled the mystery of the liberty trees: First of all, that they were actually real trees. I was concerned that the term was only a metaphor but no, they were real trees, in wood and leaves. Trees that, during the years of the revolution, had been planted in every inhabited place in France, from the most minuscule villages to the capital, as a tangible symbol of the revolutionary ideals. A magnificent custom, whose origin, however, was rooted in an earlier revolution: the American Revolution.

In 1765, the English approved the infamous Stamp Act, which imposed a tax on every sheet of paper printed in the American colonies. Printing paper had to be imported from Great Britain and had to be stamped with a tax stamp certifying the payment of the duty. In this manner, the British would be able to control anything that came to be printed in the colonies and, at the same time, the revenues from the tax would pay the expenses of maintaining the army deployed in border defense. Protests erupted immediately in all the territories controlled by the British monarchy in North America. At first, cautious and peaceful, and then more and more numerous and violent, the disorders grew more intense to the point of becoming authentic forms of rebellion against the Crown.

The most clamorous of these protests occurred in Boston on August 14, 1765. A crowd of infuriated colonists gathered under a giant elm tree and hung the effigy of Andrew Oliver, the Boston merchant chosen by George III as the official in charge of the implementation of the law. Also strung up was a boot whose sole

was painted green to represent the two ministers, Count Bute and Lord George Grenville,[1] thought to be the real proponents of the tax. This is the first public act of defiance of the English Crown, which would lead, ten years later, to the beginning of the American Revolution.

The elm under whose branches the Boston protesters gathered came to be known as the Liberty Tree, and the area around the tree where the protesters demonstrated was rebaptized Liberty Hall. When, in response to the protests, the Stamp Act was abrogated in 1766, the biggest celebrations took place under the elm tree in Boston, dressed up for the occasion with flags, ribbons, and lanterns. The tree thus became the best-known symbol of resistance to English rule and many other cities soon inaugurated their own local liberty trees.

But, as is often the case, being a symbol is not a passport to a long and peaceful life. In fact, during the siege of Boston in 1775 and 1776, upon the outbreak of the war against the English, the poor elm tree, which had been planted in 1646 and which, had it not become the Liberty Tree, would have easily survived for some centuries, ended its life precociously. It was cut down by the English and Boston's Tories and used for firewood. This Boston elm tree was the first of all the liberty trees.

But while the Americans were the first to adopt this symbol, its diffusion is without doubt to be attributed to the French Revolution. Abbé Grégoire writes in his book that the first person in France to adopt the tree as a symbol of liberty and fraternity was a certain Norbert Pressac, the pastor of Saint-Gaudens near

Civray, in the department of Vienne. In May 1790, Pressac "had a handsome oak tree extirpated from the forest and transported to the village square, where the two sexes helped to plant it." Then the pastor harangued the crowd with this phrase: "At the foot of this tree you will remember that you are French and in your old age you will remind your children of the memorable epoch in which you planted it."

The idea of planting liberty trees was embraced by the patriotic spirit of the French people and the practice spread rapidly throughout the nation. However, possessing your very own liberty tree is not always a simple proposition. Many villages do not have trees of dimensions large enough to fit the bill. Moreover, revolution or no revolution, since every town, road, and house wants its own personal liberty tree to *raise its majestic head* higher than the others, forests were besieged by search parties looking for the tallest specimens to be uprooted and turned into liberty trees. It must not have been an easy time for those we today call "vegetable patriarchs." For every large tree reasonably close to a population center, its fate was sealed. And since, as Grégoire again reminds us, "the desire to procure gigantic trees rapidly did not allow for the selection of well-rooted trees, their quick desiccation was the result."

To refurbish the scarcely dignified panorama of liberty trees dead for lack of roots, the Convention issues a decree by which "in all municipalities of the Republic in which the liberty tree has perished, a new one shall be planted between now and the first of Germinal. This planting and its maintenance

shall be entrusted to the care of the good citizens so that in every town the tree of liberty shall flourish under the aegis of French liberty." The spirit of the decree is clear: A dead tree cannot be the symbol of an eternal revolution. "Dying or dead nature must be only the emblem of despotism," Grégoire reminds us. On the contrary, "living and productive nature, which reinforces and spreads its benefits, must be the image of liberty, which enlarges its dominion and brings to maturity the destinies of France."

The liberty trees must be majestic and perfectly healthy and possess a whole series of other characteristics. According to Abbé Grégoire, the perfect tree must:

1. be strong enough to withstand the coldest climate, otherwise a severe winter would be enough to eliminate it from the soil of the Republic
2. be selected from among the tallest trees, ranging from eighty to a hundred and thirty feet tall, because the strength and magnificence of a tree inspires a sense of respect that is naturally tied to the object of which it is the symbol
3. have a circumference that occupies an ample extension of terrain
4. have an extension of shade large enough to provide citizens shelter from the rain and heat under its hospitable branches

5. be long-lived and if it cannot be eternal, at least be chosen from plants whose life can go on for centuries
6. be able, finally, to grow in solitude in all the regions of the Republic

It is clear that not all trees satisfy all these requirements and that really very few of them possess the grandiosity necessary to represent worthily the greatness of the revolution. Abbé Grégoire has no doubt that only one species possesses all the necessary features. The liberty tree par excellence should be an oak.

Finished with my reading of the little book by Henri Grégoire, I finally had a fairly clear idea of what the liberty trees had represented for the revolution, but I did not feel at all ready to face the enormous erudition of the professor. I spent the days that separated me from our meeting trying to gather as much information as possible about this fascinating history. I read everything I was able to find on the subject, but without learning much more than what I had already picked up from the abbot. The impression I got was that not all that much was known about it and that everyone, to a lesser or greater extent, did little else but repeat the things I'd read in the essay by Abbé Grégoire, even if very few of them bothered to cite it.

So it was with an understandable dose of the anxiety, which I have carried with me since the days of my university exams, that I found myself on the appointed Wednesday near the home

of the professor, well in advance of the agreed-upon hour. From his one and only trench coat, his tenacious bargaining over the sale price of books, and the story of his emigration and return to the homeland, which I had overheard at the book market, I had the idea that the professor was not well off. I imagined that he lived in a dignified but modest neighborhood. The street address where I now found myself, however, had nothing modest about it. On the contrary. Corresponding to the address indicated to me by the professor was an imposing apartment building protected by an even more imposing entrance, complete with telamons holding up the architrave. The grandiosity of the building was so at odds with the figure of Henri that I figured he had decided to get back at me by sending me to a fake address. The entrance was guarded by an enormous front door in wrought iron, and, no matter how hard I looked, I could not locate any doorbells, or an intercom, or any other system that might permit entry. The situation was becoming ridiculous. I had already tried a couple of times to knock timidly on the door. I was just about to leave when the door began to open onto a most refined atrium and an elegant doorman in full uniform welcomed me, asking if I was the guest expected by Professor Gerard. Trying to hide my surprise in the face of the unexpected luxury of the building, I replied that yes, I was. The doorman accompanied me to the elevator. "You'll find the apartment of Monsieur Gerard on the fourth floor. He is expecting you."

The professor was waiting for me in front of the entrance to his apartment, dressed impeccably in a tailor-made suit. The

amazement on my face must have been so evident that he could not hold back an uproarious laugh. "Come in, my friend, and excuse me if you see me today in such different garb from what I was wearing the last time we met." I kept up my incredulous stare. "There is nothing that can't be explained, believe me. The version of myself as a book hunter that you met at the market is the real one. Don't let yourself be deceived by appearances. I can't in the least afford this apartment, and the suit I'm wearing is also the only elegant suit I own and I use it very rarely. But today felt like a happy occasion worthy of celebration: two colleagues with a shared interest in liberty trees. I'm sure that doesn't happen often. This apartment was left to me as an inheritance by my parents. My mother's family once owned the entire building. Then this apartment was all that was left . . . and I'm lucky I don't have to pay the condominium fees. I could never afford them on my high-school teacher's pension. Well," he continued, smiling at me, "I hope this gets you talking again . . . otherwise, I'll have to hurry up and change my clothes."

I shook myself out of my stupor and muttered some words of apology. Meanwhile, Henri led the way into a monumental apartment that, on first glance, contained nothing but books. We walked through an endless string of empty rooms. Aside from their floor-to-ceiling bookshelves loaded with books, there was not a single chair, table, or painting, or any of the usual household furnishings. Only books. Thousands and thousands of them. As we were walking, the professor rapidly indicated the subjects in which his vast library was subdivided. "In this

room and the next, ancient history. Then the Middle Ages, Renaissance, the Enlightenment. Here, travel, there, geology," and so on, room after room, subject after subject, until we came to a large sitting room. Finally, a long table, several chairs, and two enormous armchairs. On one side of the room there was a fireplace and, above the fireplace, in the only space in the house not occupied by books, a large painting of a gentleman in ecclesiastical garb sitting at a desk, whom I figured must have been an ancestor.

The professor gestured me to one of the armchairs and invited me to sit down. He hadn't yet sat down in the other one before he was asking me impatiently, "So? Don't keep me on pins and needles. What have you discovered about our beloved liberty trees?"

I started telling him about the contents of the book. I had prepared myself for the exam and my summary was replete with data and references. All the same, nothing I was saying seemed to be of the slightest interest to him. He kept nodding as though all my information were old news. The only novelty was the booklet itself. He hadn't been able to find any reference to this work by Grégoire. None of the authoritative sources he had consulted, including the catalogue of the National Library of France, listed the abbot's essay. This, however, was not as rare an event as one might think, especially for works published in the early years of the revolution. In that period, short essays of a few pages, like the one that had fallen into my hands, were rather common. They were used as manuals to be consulted by the citizenry. "These

booklets," the professor began, "contained practical directions, often to be followed with complete fidelity to the text, for the achievement of objectives to which the Convention had given top priority." What the professor found least convincing of all the indications reported by Abbé Grégoire was the requirement, repeated several times in the text, that liberty trees had to be enormous.

"I don't understand why they had to select such big trees," the professor continued, shaking his head. "Majestic and long-lived, fine, but obtaining really large specimens must have taken a huge effort and substantial resources." He couldn't be persuaded, couldn't believe that the Convention had required such an endeavor for a simple symbol. "At the time, the level of difficulty must have been colossal," he went on. "Imagine having to uproot a tree eighty to a hundred feet tall, presumably weighing up to several tons. They would have had to dig enormous holes in order to preserve the precious root network. And how did they manage to keep the uprooted trees from falling to the ground? How many people did they need to bring off an operation of that magnitude?" As he spoke, he kept shaking his head, with increasing frequency, to underline his incredulity that all of this was possible in the years of the revolution. "And that's not all," he continued. "The trees had to be transported long distances, even several kilometers, through forests without roads. I don't see how such a thing was possible."

The difficulties were indeed enormous. "Anyway, Professor, we have to be careful not to make the mistake of believing that

people in the past were not capable of performing huge tasks. Just look at the pyramids. Even without the means we have today, people have always been capable of accomplishing great things."

Henri didn't seem convinced. "I don't know. You're right about the past, but in this case there's something that doesn't ring true. Can you imagine the Convention forcing thousands of people to take on such huge tasks for a symbol? It was a time when the people were fighting for their own survival and for the ideals of the revolution."

He paused and went to one of the bookshelves to get the ordinances of the Convention in 1792. "Look here: food, transportation, hygiene, militias, animals, canals, defense, borders. These were the things they had to take care of. Certainly not the moving of gigantic trees from the forest to the city centers. The more I think about it, the crazier it all seems. And keep in mind that we're talking about an ordinance of the Convention! It would not have been tolerated that the revolution was represented by dead trees planted in the village center. Really, I don't understand it. Today, when we have immensely powerful machines, the survival rate of transplanted large trees is extremely low. Only a few specialized companies are able to guarantee good survival rates. At that time, there must have been innumerable trees that died and those responsible would have been hard-pressed to explain why."

He was right, the same thought had occurred to me. "A few years ago," I explained, "a good friend of mine showed me some images documenting the operations necessary for the

transplanting of large trees from a forest to the gardens of a villa owned by a Russian magnate. Even though the trees had to be transported for an average of less than five kilometers, new roads had to be built in the forest that were wide enough and robust enough to allow for the passage of the trucks and machines involved in the transplanting. They had to use scaffolding, cranes, steam shovels, and trucks dozens of yards long to transport the trees from the forest to the villa. At the time of Abbé Grégoire how could they have moved thousands of large trees from the forest to the centers of populated towns and villages and replant them in a way that ensured their survival? It must have been an extremely complex operation requiring the employment of huge numbers of people. So how do we explain that not a trace of these enormous undertakings is to be found?" The professor intervenes: "You're right! I hadn't thought of that. For the transport of those enormous trees throughout France, you would expect to find all kinds of prints produced to commemorate the enterprise. But I can't recall ever seeing even one. There are hundreds of drawings regarding the liberty trees, but none that show their transportation from the forest to the towns." He got up again and without hesitation pulled down from a shelf a large volume of prints from the revolutionary period. "Take a look at these while I make some coffee. Maybe we'll get lucky." He handed me the volume and went off in the opposite direction from where we had come.

I started leafing through the book distractedly, slowly turning the pages one by one and devoting only slight attention

to the succession of prints. I was much more interested in looking around the room. How big was that apartment? By my calculations, just the room where we were sitting had to be much bigger than my entire apartment in Italy. At Paris prices, owning an apartment that size and in that neighborhood made the professor a very wealthy man . . . yet there was something strange about it all. The total lack of furniture, the less than satisfactory level of cleanliness, his clothing, except for the luxurious suit he was wearing today, all told a different story. Much more modest. And those books. How could it have been possible to buy them on a high-school teacher's pension?

These were the thoughts chasing around in my head when, on one of the pages of the ponderous tome I was leafing through, I saw something that caught my attention. It was a map of Europe and the Americas and, if it hadn't been for the caption at the top, "Fraternity Trees," and the date, 1848, I probably wouldn't have tarried over it another second. At first glance, it didn't have any noteworthy characteristics, yet its title was clear: In some way that map concerned the subject that was dear to our hearts. Despite examining it attentively, however, I didn't see anything of interest. Everything was in its place and nothing seemed any different from an ordinary geographical map. But then, why that title, "Fraternity Trees"?

I brought the map up closer to my face to get a better look. It seemed like I could glimpse something like a thick network of lines uniting the villages and cities on one side and the other of the Atlantic. I felt a chill run down my spine. I reexamined the

map with more calm; I had to be sure. It really resembled a root network, but the map I was looking at was only a reproduction and not even very detailed. Maybe they were only wrinkles in the paper, shadows, or some lines with a completely different meaning. Maybe I was so used to studying root networks that I was beginning to see them everywhere. Yet the more I examined that map, the more it seemed to me that the roots extended to connect the place-names. I decided to think of something else; I would ask the professor to tell me what he saw. I started getting the sensation that sometimes comes over you when you're watching clouds go by and suddenly an image emerges that is so clear and precise you can't imagine that other people can't see it, too, or that they see something else.

The professor called to me from the kitchen. "Come and give me a hand, please. I can't carry everything out there by myself." I helped him bring the coffee and everything necessary to serve it and we sat back down in our original places.

"Did you find anything?"

"Something, maybe, but I'd like to hear what you think of it." I opened the book to the page with the map and handed it to the professor.

" 'Fraternity Trees,' " he read at the top. "They're the same thing. Liberty trees or fraternity trees—they are referred to with both names indifferently." I waited anxiously; I didn't want to be the one to suggest what to look at. "But I see absolutely nothing of interest. The thing I don't understand is why this map has this title. You'd expect to see a map with the location of the trees and

instead there's nothing. A perfectly ordinary map." He looked at me quizzically. "What was I supposed to see?"

"Take a closer look, please." I didn't want to influence him in any way.

The professor put his glasses on and moved closer to the map to check the details. Suddenly, a look of surprise came over his face. He started shifting his gaze from one side of the map to the other, moving in closer and then farther away. More and more puzzled as the more careful examination revealed something that he hadn't seen before. "You mean these thin lines, right?" I nodded in satisfaction; he could see them, too. "They would seem to be a sort of road network that joins the towns and cities of the two continents. But obviously they can't be roads. Look here, for example, dozens of these lines cross the Alps in places where I don't think any passes or trails exist. And then in some areas the lines are much more dense than in others, even though they are regions where the arteries of communication must have been very scarce in 1848. Look here, in southern Italy"—I moved my chair closer so we could study the map together—"there is a thick network of lines running right through Calabria. But Calabria had very few roads at that time. Anyone who wanted to go from Naples to Sicily went by ship, precisely because it was so difficult to find practicable roads."

The professor got up and went into another room to get a road atlas from 1890. The resources of that library were infinite. "This I got at the George Brassens market," he said with a smile. He leafed through it until he came to a map of southern Italy. "Here we are. This shows that in 1890 Calabria had very few

roads . . . meanwhile our network in the same area is very thick, even though it refers to fifty years earlier." He raised his eyes from the map and looked at me confused. "What do you think these lines mean?"

While he was speaking, a crazy idea went through my head, but I didn't want to talk about it yet. I needed to think about it some more. So I kept my response vague. "To me they look in every way like roots joining regions, cities, and towns on one side and the other of the Atlantic."

"Roots?" He looked at me like I was out of my head.

"Yes, roots, and don't look at me like I'm mad. I've spent my whole adult life studying roots. Believe me, I know a root network when I see one. And the one here on this map is undoubtedly the topographical representation of a root network. Or, if you really want to know, I believe it is the representation of a network of root networks."

"A . . . what?" the professor almost shouted.

"It has the exact shape of the representation on paper of an underground network of the roots joining the trees of a forest."

Now the look on his face was more attentive. "Could you explain that better? Keep it simple, please, despite my passion for plants and botany books, my knowledge of how plants work is very rudimentary."

"Well, this should rightfully be a rudiment. The trees that are part of a forest or a wood are not separated from one another. Rather, by way of their roots, they form an underground network that joins them all together in an enormous widespread network.

A forest, in other words, should be seen as one superorganism born of the interaction among the trees that are part of it. A little like what happens in an ant colony. There are countless ants in a colony but the entire colony behaves as though it were a single individual. The same thing happens with trees." I looked at him. "Does that not suggest something to you?"

The professor again looked quizzical. "What should it suggest to me?"

"The fact that trees are joined together in a community. Or in a 'confraternity,' to use a term closer to your customary field of study."

"So, if I understand what you're telling me, these maps would concern a confraternity of trees—"

I interrupted him. "Not simple trees but liberty trees. In fact, I don't think it is a coincidence that the map uses the less common name 'fraternity trees.' Maybe I'm wrong, but it seems to me that the maker of this map actually wanted to point out to us the greater value and benefits of a confraternity of individuals compared to the same number of single specimens. When you think about it, the motto of the French Revolution, *Liberté, égalité, fraternité*, though never fully realized in any real human community, has, on the contrary, been perfectly realized in vegetable communities that live in a regime of perfect sharing through these networks that unite them—"

The professor interrupted me immediately; he was much less disciplined than I in the guise of the student. "But if what you're saying is true, it should be very simple to verify."

"How?" I asked him.

"To start with, if this map actually represents the relationships between the fraternity trees, it seems obvious to me that every node of the network marks the place where a tree was effectively planted during the revolution."

"Not only during the Revolution of 1789," I intervened. "Look at the date: 1848. I don't think it's a coincidence. I've read that the 'revolutionary' practice of planting liberty trees or fraternity trees continued with even greater enthusiasm during the uprisings of 1848."

While I went on talking the professor stopped paying attention to me and started looking for some book among the endless rows of bookshelves. He moved around the room from one side to the other, following sections and leads that only he was able to understand, murmuring the names of authors and book titles that passed before his eyes. He pulled out one book after another, leafed through them quickly, and then nervously put them back in place. "I remember very well having seen someplace a list of the liberty trees planted up to 1792. But I can't manage to find it." He kept roaming around the room until, with a liberating "Finally," he pulled down a book from the early twentieth century with a list of towns and cities that had certainly planted liberty trees.

By now, the number of books we were consulting was becoming unmanageable while sitting in armchairs. The professor suggested we move to the long table to work more comfortably. "So, I'll give you the place-name and you look to see if it's on the map and, above

all, if it is a node in one of the root networks." He started reading off a series of village names. I immediately suggested that we switch roles. My knowledge of French geography wasn't sufficiently detailed for me to know the location of the minuscule hamlets that the professor had started to list. "I don't know where they are either. Better to use the Internet to find their correct locations." The professor read off his toponyms and, after pinpointing their exact position on the Web, I tried to locate them on our map. It was soon evident that this system didn't work. In its original form, the map was more than five feet long and three feet wide. It had been greatly reduced to make it fit onto a double page of the volume and a lot of place-names were illegible. In order to work effectively, we had to find the original or a far more detailed reproduction. Otherwise, we would never be able to see the correct names of the localities and ascertain whether the lines that we could just make out on our copy really represented a root system. In order to achieve any certainty that this whole story was not just the fruit of my imagination, we had to be able to study the original. Although the volume itself had no information that could help us work our way back to the original map, the professor was confident that we would be able to find it quickly. "You'll see, the National Library will be able to tell us something or, better yet, the Carnavalet Museum, which has an excellent collection of prints from the revolution. An old friend of mine works there, I'll call him in the morning and let you know."

The next morning—I hadn't even finished breakfast—I got the call from the professor. "Please, meet me at the Carnavalet as soon as you can. I've found the original. It appears that the

mapmaker really did want to draw an enormous global root system. Hurry up, I'm anxious to hear what you think." I rushed, and in less than half an hour, we were sitting before a print of the fraternity trees. Its dimensions were much larger than the minuscule reproduction that we had tried to study first. Now, what had looked to us like almost imperceptibly thin lines joining different regions and cities, turned out to be roots without any doubt. Besides, the reproduction that we had consulted at the professor's house was missing the entire upper piece. In the original, which we now had before us, the image appeared in its entirety: It was an enormous poplar tree whose base was the starting point for the root system that connected the continents of Europe and the Americas.

"It is, for all intents and purposes, a map, or if you prefer a plan," the professor commented, content with his play on words, "that represents all the liberty trees planted up to 1848."

"No doubt about it. And also a very detailed plan, I would say. Now that it's easy to follow the roots on the map, you can see that the places connected by the system number in the thousands."

We got right down to work and, using the list that the professor had brought with him, went on with the operation we had started the evening before. Henri read the list of place-names where a liberty tree had been planted, and I checked whether the roots on the map created a node in correspondence to the place-name. In short, it became evident that we were looking at a map of all the world's liberty trees. Not only were their places represented on the map, but the thickness of the roots connecting

the various localities was greater in proportion to the number of fraternity trees planted in a specific region. A fascinating representation of the functioning of a network, like so many that can be seen today in the research of anyone interested in complex systems,[2] but in 1848 it was decidedly cutting edge.

"Did you recognize the tree that the root network we are studying belongs to? It's a poplar."

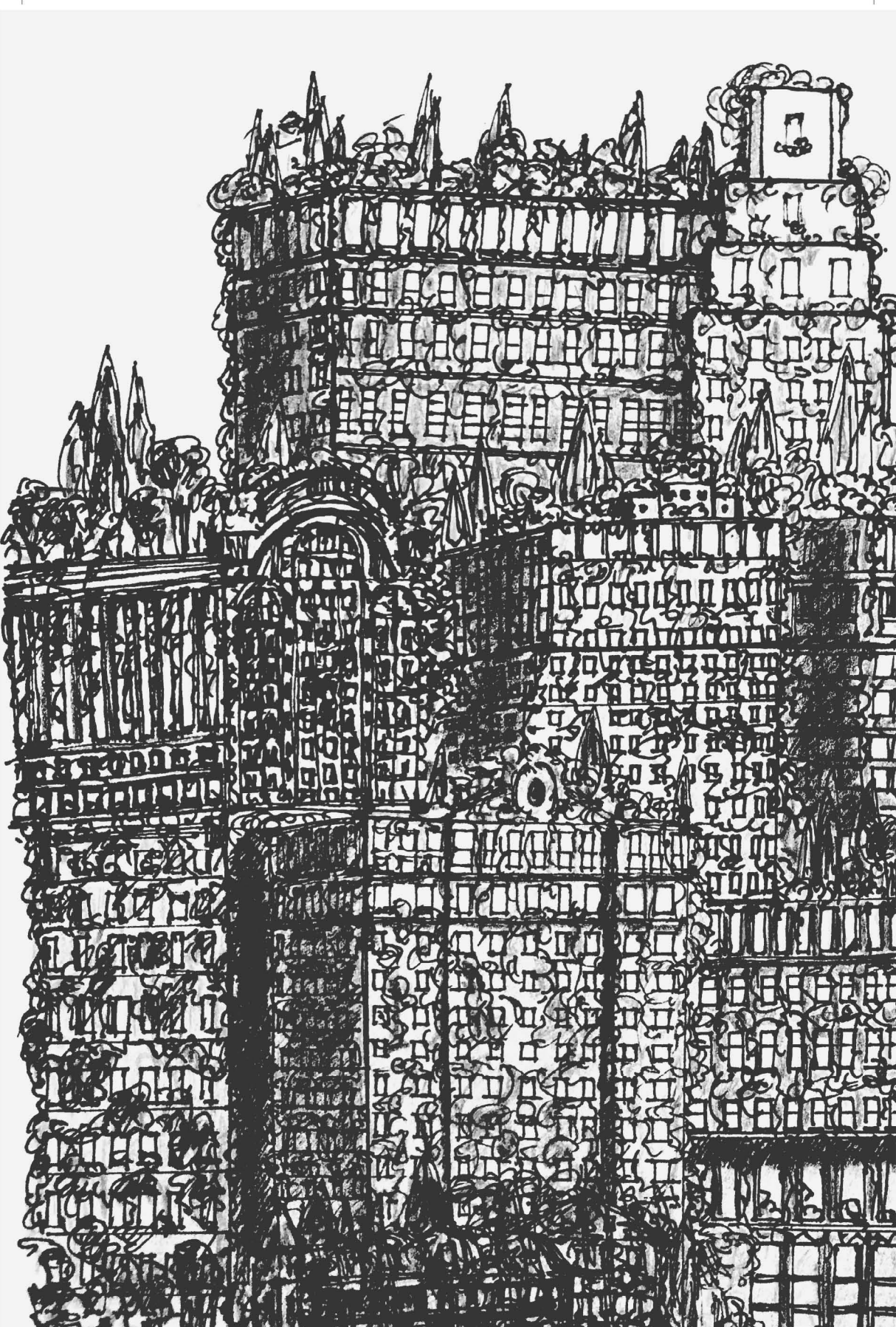
"And so?"

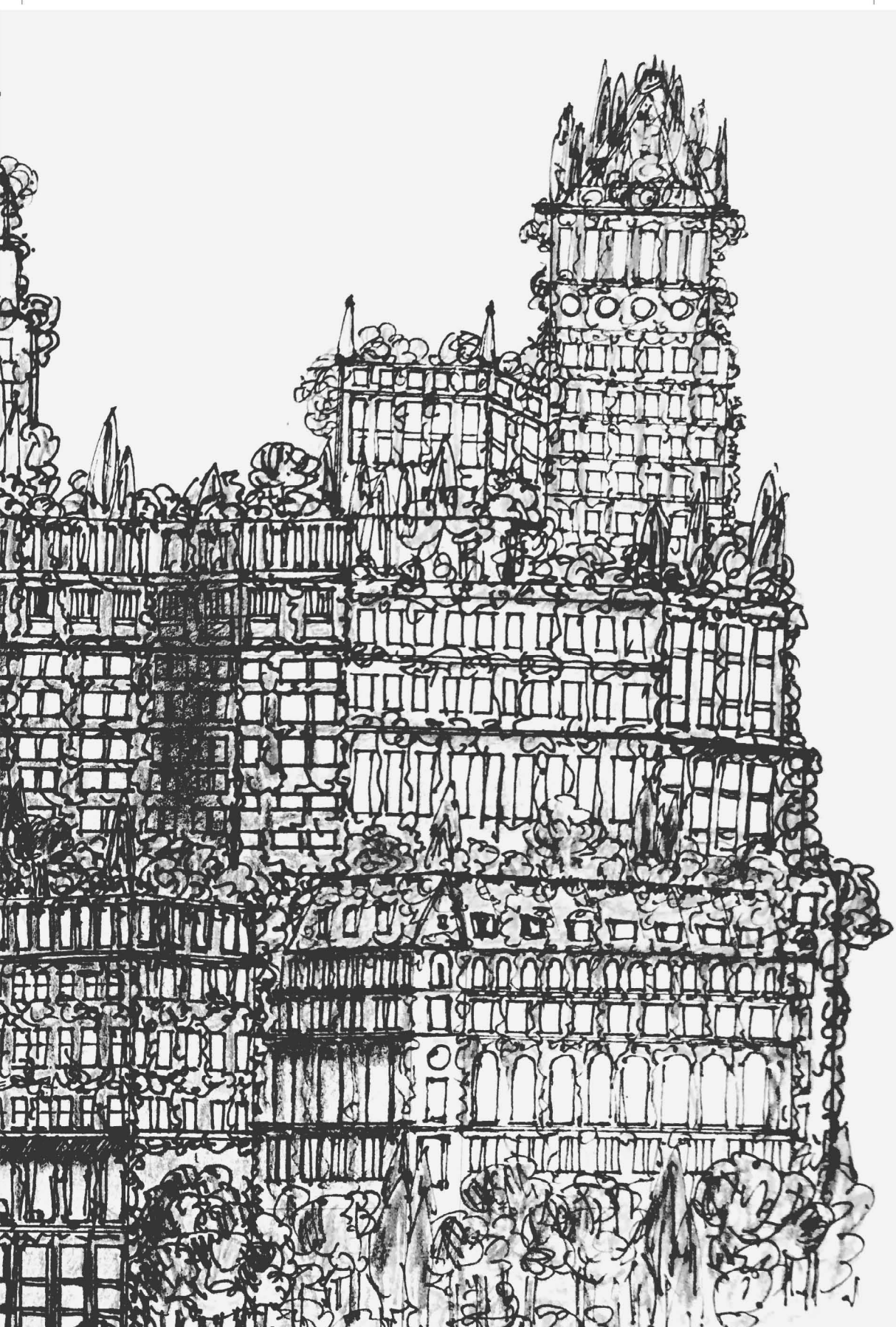
"I don't think this species was chosen by chance. The Latin name for poplar is *populous*, people. The maker of this print wished to emphasize the tree's symbolic value. In sum, the plan of and for the world is the plant of the peoples that embraced the spirit of the revolution."

That day we finished checking the list of the liberty trees and, thanks to the map, were able to add a host of others. According to the list we put together, hundreds and perhaps thousands of liberty trees were planted in Paris alone. They were distributed in such a way that there was practically always one nearby. Every square, open space, parklet, or sizable courtyard had one. Even the suburbs of Paris had to have been covered with liberty trees. In France, as of 1792, an enormous number of trees had been planted. Abbé Grégoire writes: "In every town you see magnificent trees that raise their heads in defiance of the tyrants; the number of these trees comes to more than sixty thousand, since even the smallest villages are adorned with them and many of the large towns in the departments of the Midi have them on every street or even in front of the houses."

Of these fraternity trees that for a period of time united the places of the revolution in an invisible network only a few have survived, all hidden in out-of-the-way corners of Europe. In the great cities like Paris, for example, they no longer exist. Because they were such visible symbols, they soon became the targets of reprisals. They were mutilated, cut, lacerated, engraved with royalist inscriptions. The Convention having made them the object of continual legislative provisions made them one of the obvious emblems of a regime hated by many. As early as 1800 (Year VIII of the Revolution), only a few were left. During the Consulate or the Empire, those few survivors were rebaptized "Napoleon Trees," only to be definitively eliminated during the Restoration.

Some liberty trees were replanted in 1848 and still others during the brief experience of the Paris Commune in 1871. But each time the political regime changed, it was the liberty trees that paid the price: They are easy to cut down, they make a big noise when they fall, and they don't put up fierce resistance. So the survivors of the season when the trees united the peoples are really very few, unregistered, and generally located in villages or backwater towns in France or Italy. In Calabria, for example, there are some that managed to survive the Bourbon Restoration, or even worse, unplanned urbanization. But they are disappearing there, too. Soon there won't be any left. It would be useful to protect them and to tell their stories before the last liberty tree that we're able to see will be the one engraved on the French two-euro coin.





Unlike the ideal cities represented in Renaissance paintings, filled with architectural constructions and without the slightest trace of a single leaf of grass, the cities of the future will have to be completely covered with plants.