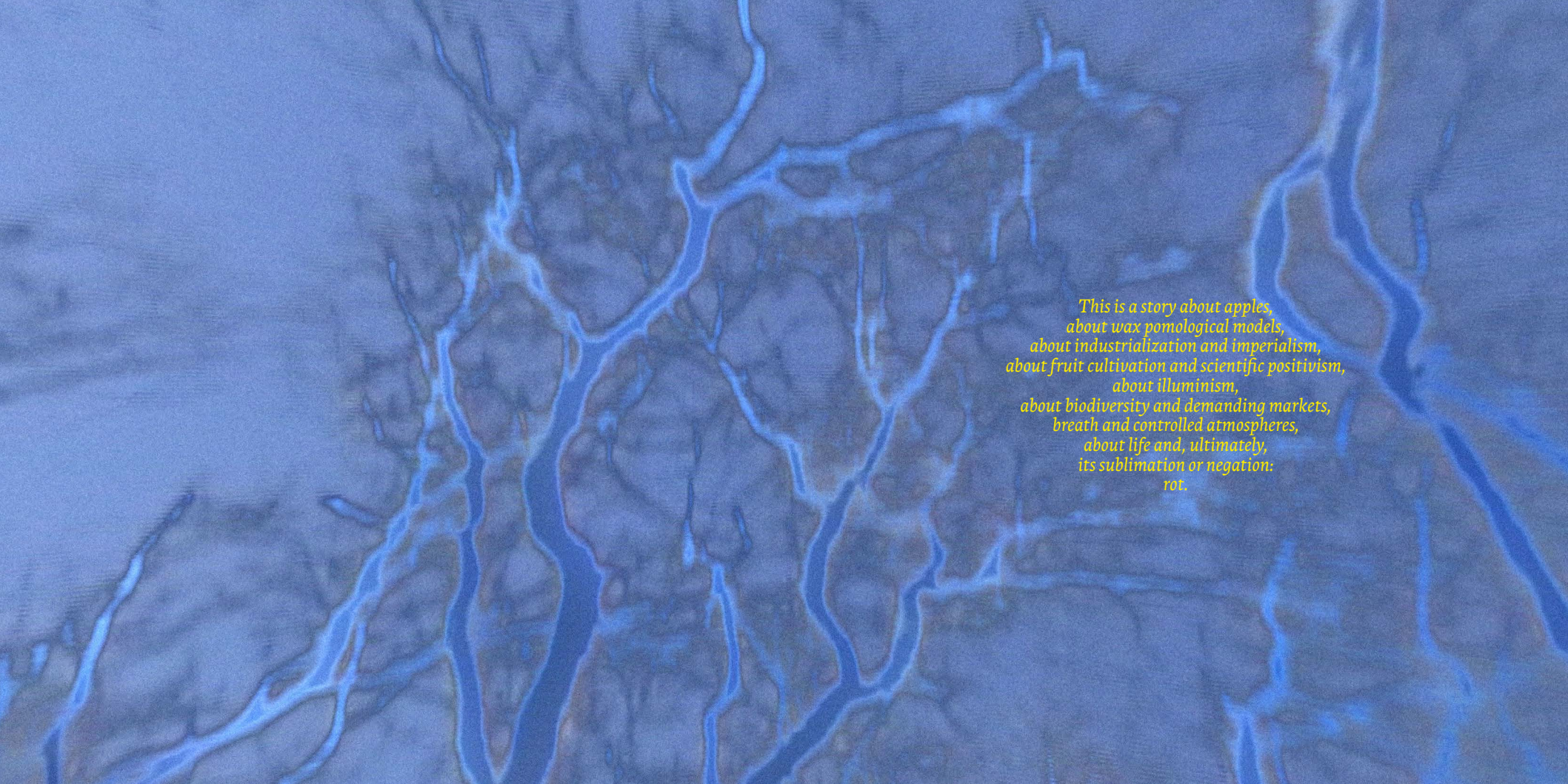
[research excerpt]

POMONA ARTIFICIALE

a story about pomological models

POMONA ARTIFICIALE

a story about pomological models



This is a story about apples,
about wax pomological models,
about industrialization and imperialism,
about fruit cultivation and scientific positivism,
about illuminism,
about biodiversity and demanding markets,
breath and controlled atmospheres,
about life and, ultimately,
its sublimation or negation:
rot.

A vector is always rectilinear.

However, it may be linked to a fixed point through an arm. In this circumstance, the point to which the vector remains constrained imparts a rotation to its motion: this rotation is called *momentum*.

It seems meaningful to use the term “moment”. A word we already know as part of our everyday life, that we use when we recall, for example, the specific moment when our proceeding through life got entangled with certain situations, circumstances, or people, and that bond created a rotation, a deviation from our rectilinear path.

A turning point,
more or less significant.

We often think of movement — as the possibility of altering one’s own momentum — as something pertaining to what is alive and breathing.

Yet, at times,
inanimate entities experience profound deviations in their imperishable procession through time.

ACT I
PHYSIOLOGICAL MATURATION

In the mid-19th century, Italy was going through a period of intense agitation: it was a crucial political season, with the project of national unity taking shape, and the entire country moving towards industrialization, following the example of the neighboring European states.

It was the 5th of March, 1858.

It was night.

Francesco Garnier Valletti was sleeping in his home-laboratory in Via Dora Grossa. In a dream, he was revealed a new material and a method for manufacturing his wax models, based on a mixture of virgin beeswax, Dammar resin, and alabaster powder. The deep value of this preparation doesn't lay in the composition of its blend as much as in its usage: if casted into molds, it results in a material that can be softened with heat, like wax, and might therefore be worked, smoothed, shaped, and welded using ceroplastic techniques. Once cooled, it acquires the consistency and strength of plaster without its fragility or weight.

The botanical models produced with this technique embodied the ideals of the positivist historical context and the flourishing imperialist taste for collecting, documenting, and classifying the natural world.

These objects sublimated a broader tendency, emblematic of the 19th century, to catalog as vast a portion of reality as possible.

At that time, alongside the first experiments with industrial fruit cultivation, the nursery industry emerged, because most fruit-bearing plants propagate vegetatively, by cutting rather than by seed. New plantations were established in late autumn or winter, just after the end of the apple tree's fruiting season. This agronomic limitation emanated the urge to showcase a representation of the fruit that the plants would eventually bear to the industrialists buying them.

Meanwhile, agricultural institutes grew interested in pomological reproductions as research tools. In this new academic setting, they acquired a fundamentally pedagogical value, linked to the idea of a naturalistic archive that would support the development of studies in fruit science.

The contemporary standardization of crops, rooted in the agricultural industrialization of the late-19th-century, induced a second major shift in the meaning of Garnier Valletti's collections.

Until the first decade of the 21st century, no more than five apple varieties were cultivated industrially worldwide. Today, these collections of pomological models were commisioned as tools for capitalistic acceleration, representing hundreds of apple varieties, providing witness to an agricultural biodiversity that has now been lost.

ACT II SENESCENCE & OVER-RIPENING

The chlorophyll in the apple's leaves produces sucrose through photosynthesis. The sucrose is converted into starch, which accumulates in the fruit's plastids.

Ethylene induces the activation of α-amylase and β-amylase, α-glucosidase, and sucrose synthase. The starch is broken down into smaller molecules — maltose and dextrose. Maltose transforms into glucose. Glucose is once again converted into sucrose and fructose.

This process allows the fruit to breathe and to live — until it exhausts its starch reserves.

Then, its decay begins.

Now it experiences this expanded life within a controlled atmosphere.

Can you hear it?

The breath slowing down.

Ever so slowly, it moves toward the truth.

What is its boundary?

As people are confined within an urban reality, devoid of contact with the natural world, the natural world gets immediately idealized. today it has emerged a certain tendency to rediscover, to value, the diversity that once defined our food system.

The protection and restoration of biodiversity, now presented as a priority for the agricultural supply chain, is nothing more than the reflection of a productive drive responding to market demand.

The resurgence of lost varieties is instrumental in satisfying the desires of a society fascinated by the exotic and the new — a system at collapse, attempting to survive the ecological crisis it has created. Restoring lost biodiversity is valued as an asset in the realm of genetic engineering, recovering desirable features, such as a source of resistance genes against specific bacteria or fungi, extreme dry or rainy climates, and increasingly controlled storage conditions that extend the fruit's lifespan as much as possible.

This is your truth,
my boundary.

Now you live your rotting,
perhaps the *momentum*
of your life,

your decay.

I, however,
have plucked
the apple of your omnipresence
from the tree of good and evil,

and my fragile body
has deluded itself into infinity.

Now you have become blurred
within the spirals of roots,
of days,
of thoughts.

I am my truth,
your boundary,
and in you,

I live the rejection
of my own decay,

my fragile body.

Interview with Ilaria Mignani, curator of the Garnier Valletti collection in University of Milan

23012025

How has this collection evolved over the years? How has its value as an archive and research tool changed during this process?

The history of our collection is closely tied to the personal story of Garnier Valletti. Born in 1808 in Giaveno, on Lake Maggiore, he initially worked as a confectioner, making decorative candies and ornamental fruits. However, being quite ambitious, he moved to Milan, which at the time was already a much more dynamic economic and cultural hub than Giaveno or Turin. In Milan, he began creating artificial flowers, which brought him great success, earning awards at international exhibitions.

Thanks to his exceptional craftsmanship, he was noticed and spent several years at the courts of France, Prussia, Vienna, and finally Saint Petersburg, where he worked as a decorator, making decorative fruits and flowers. Meanwhile, his wife remained in Turin with their four children. In her letters, she expressed frequent complaints because of his absence.

In 1848, after his wife's death, Garnier Valletti returned to Turin and had to find a way to financially support his children. These were pivotal years for the country, as the movement toward Italian unification was taking shape, and Italy was following Europe's lead in moving toward industrialization. During this period, the first experiments in industrial fruit farming began. The Reda brothers, gardeners for the House of Savoy, were sent by the royal family to study techniques already being used in Germany. This led to the emergence of the nursery industry, as most fruit plants do not propagate by seed but by cuttings, meaning through vegetative reproduction. New plantings were typically done in late autumn or late winter, but fruit trees often took years to bear their first fruit. Today, with modern techniques, this process is much faster, but back then, it could take 8–10 years before seeing the first harvest. So, there was a need to show clients what kind of fruit the plants they were commissioning and purchasing would produce.

This is where Garnier Valletti came in, creating models of the fruits that different varieties would yield. Nurseries bought them, agricultural schools bought them, and there are still remnants of such collections scattered around.

How did our collection come about?

It was established in 1872 by Società Orticola di Lombardia, which decided to equip the Royal Higher School of Agriculture with a collection of fruit models to create a pomological museum. In 1872, its members contributed 20 lire and commissioned the first part of the collection, consisting of about 800 pieces. Unfortunately, we don't have an original catalog, and since the Società Orticola di Lombardia headquarters has suffered from fires and floods, neither the donation act nor the payment invoice survives.

So, we don't know exactly how many and which models there were. What we do know is that we have a core of 800 original pieces by Garnier Valletti, and about 900 later pieces.

What was the intended value and purpose of this pomological collection? Did that change over time?

Fundamentally, it was educational.

Before photographs, all teaching relied on models. The purpose of this archive was to foster the development of studies on the science of fruit farming, spreading knowledge about the varieties being produced, first locally in Lombardy and later across neighboring European states.

The value of these models, as I mentioned, was initially educational. But today, the collection also holds artistic and scientific significance, as it provides witness to the agricultural biodiversity of the past, a highly relevant topic today. With the standardization of crops, until recently, only about five apple varieties were cultivated industrially worldwide.

Now that the damage caused by this loss of biodiversity has been recognized, efforts are being made to revive some ancient varieties and create new hybrids. Today, the number of apple varieties cultivated worldwide might be around twenty.

What are the reasons behind the significant loss of biodiversity in the pomological landscape over the last century?

As they ripen, apples and pears accumulate starch — a complex polysaccharide, a slow-degrading sugar — so their shelf life has always been much longer compared to stone fruits (peaches, apricots, cherries, plums, ...), which accumulate simple sugars instead. Once the processes of ripening and senescence — linked to cellular respiration, which fruit, like all living organisms, undergoes to survive — are complete, the fruit begins to die.

For this reason, the shelf life of a peach, even in a refrigerator, is no longer than a month, while an apple can last up to a year. Thus, since multiple varieties of stone fruits are needed to cover an entire market season, their varietal diversity has been preserved.

Instead, for apples — which can last a year and be transported across the world (today they are stored in controlled-atmosphere environments with 96% nitrogen and only 4% oxygen and carbon dioxide to minimize respiration) — there is no economic incentive to maintain hundreds of cultivated varieties.

As a result, in the past century, only few of them with strong storage potential have been selected. They later realized the strategic short-sightedness of this decision: if a disease to which one if this varieties is susceptible were to emerge, it could wipe out an entire harvest. Additionally, when a single variety is widely adopted by new fruit farmers, it leads to overproduction and a subsequent drop in market value.

These factors, combined with a general trend in the food industry, over the past fifty years, to constantly introduce new products to consumers, have led to the beginning of a shift toward diversification. This is further driven by the economic potential of patenting new varieties and profiting from them.

This role as a witness to lost biodiversity is one of the most fascinating aspects of the Garnier Valletti collection. I find deeply intresting that its origins lie in an industrial context — within a cultural climate of absolute industrial positivism — which eventually gave rise to the ecological crisis we are experiencing today.

Garnier Valletti's models indeed bear witness to very important biodiversity. Back then, there were no transport infrastructures or refrigeration facilities, so every region and microclimate had its own varieties that ripened at different times.

Today, thanks to refrigeration techniques, we could rely on just one variety and store it for an entire year, but that wasn't the case back then. It was essential to have a variety of fruits in your orchard to cover the entire season.

Interview with Marina Maniago, member and secretary of the Turin Academy of Agriculture

10022025

The collection we store here (editor's note: in the Turin Academy of Agriculture) was entrusted to us by the municipality of Turin at the end of the 19th century. In 1899, I believe.

So, unlike other larger collections that survived (editor's note: those of the University of Milan and the Fruit Museum of Turin), this is not a commissioned collection. Its uniqueness lies primarily in the drawings: Garnier Valletti practiced this form of craftsmanship to make a living, and at the time, the world did not see his work as art. This is why, while his pomological models were preserved for their commercial and educational value, the same cannot be said for his preparatory studies, which are a unique feature of our archive.

Interpreting this archive as a witness to a now-lost biodiversity, what do you think its value is?

As soon as people find themselves confined to an urban reality, lacking direct contact with nature, they immediately begin to idealize it.So, in recent years, there has been a growing tendency to rediscover and appreciate the diversity that once characterized our food and agricultural systems.

It is good that people are talking about how the production of what we eat has a history, that our current production systems are neither eternal nor immutable.

However, that history is not necessarily something that can be revived, because the conditions have changed.

While researching counter-movements related to biodiversity loss, I came across numerous initiatives focused on preserving and recovering specific tree specimens capable of producing nearly extinct fruit varieties in an attempt to save them. Do these kinds of actions have a value beyond the poetic one?

By studying these varieties today, with genetic engineering, we have the ability to modify plants so that they provide us with resistance genes. So, as has always been the case, we manipulate nature to gain the greatest possible benefit from it.

Beyond this specific application, such an effort may have historical or philological significance, but from an economic standpoint, it has none, and farmers grow crops to make a living — they do not operate under a different ethical framework than any other entrepreneur. The loss of varieties, even from an agronomic perspective, is primarily assessed in terms of the loss of genetic resources: resistance genes against specific bacteria or fungi, or adaptations to extreme climates, excessively dry or wet. From the genetic pool of these plants, something valuable can be extracted in this regard, rather than reviving their cultivation. After all, if certain plants have been abandoned in recent years, it is likely because they were not sufficiently profitable, easy to grow, or simply resilient enough for modern agricultural strategies.

It is unfortunate when things are lost, but the fact that humans alter evolution is a historical constant: we now seek biodiversity because people are looking for biodiversity, in order to bring products to market and generate income from them.

Interview with Paola Costanzo, curator of the Francesco Garnier Valletti Fruit Museum of Turin

10022025

How was the Museo della Frutta established?

The Agricultural Experimental Stations were established across Italy following the policies of Camillo Cavour. Agricultural Academies already existed, but they primarily focused on theoretical knowledge, lacking a direct connection between researchers and the laborers who actually toiled in the fields.

To bridge this gap, Cavour established the Agricultural Committees and the Experimental Stations, in essence, institutions for applied research, in the latter half of the 19th century. before long, they became known as Agricultural Chemistry Experimental Stations. This change reflected the shift from subsistence farming to fully industrialized agriculture, with all the consequences that entailed.

The pomological collection now housed here was acquired by Francesco Scurti for the Agricultural Experimental Station on Via Ormea (editor's note: in Turin). When we entered the facility — just before it was about to be evicted — we realized that everything inside needed to be preserved. Beyond its aesthetic appeal, it holds immense ethnographic and anthropological value.

That's how the idea of a museum came about. The university wanted to create a scientific museum inspired by positivist thought, which in some way influenced figures like anatomist Luigi Rolando, criminal anthropologist Cesare Lombroso, and Garnier Valletti, who was working in agronomy during the same period.

Can you elaborate on the connection between Garnier Valletti and the industrial positivism that characterized the second half of the 19th century?

After his travels in France, Prussia, Vienna, and Saint Petersburg, Garnier Valletti was hired by the Burdens, who had opened their first nursery as early as the late 18th century. Nurserymen of that time played a different role than what we associate with them today. They didn't just sell plants, they were also engaged in research.

Auguste Burden hired Garnier Valletti with a dual purpose. First, for research, in line with the 19th-century urge to categorize and catalog all knowledge within a given field. Second, for commercial developmen: he wanted a three-dimensional model so that salespeople could see the fruits that specific plants could bear. These simultaneous objectives led to the creation of actual commercial catalogs through which they innovatively sold their plants by mail.

What is the significance of this collection?

We preserve approximately 700 models. One of the most fascinating aspects of this collection is that each model is based on a real fruit, meaning that all these varieties were present and available during the second half of the 19th century, when he was active: the collection serves as an extraordinary record of biodiversity.

This, in turn, highlights a paradox within the museum itself: one of the key research areas of the institution was fruit preservation through refrigeration — the very technology that enabled the genetic selection of fruit varieties best suited for long-term storage in cold rooms.

Memory is what drives historians. History itself is memory and preservation. The value of this collection lies in its role as a historical testimony to a defining period in modern Italy.

a special thanks to
Paola Costanzo, Marina Maniago, Ilaria Mignani and Valentina Rossi,
without whom this project
could not have existed.

Andrea Martinelli

2025

Typeface 1

Redaction 0, 20, 50 & 100
Jeremy Mickel
MCKL Type Foundry
20 20

Typeface 2

Columba Text Pro
Lewis McGuffie
Colophon Foundry
20 20

Paper

Mondi laser
100 g/m2

Cover

Folex Imaging
transparent film

Print

Design Academy Eindhoven
Eindhoven (NL)

Printed in

January 2025