

# BIODIVERSITY

22 July 2017

## LOOKING AND SEEING

A woman has been travelling for years to the arboretum on the far side of Istanbul, just to see a Ginkgo tree. Then one day, walking through her own neighbourhood, she notices: there are three Ginkgo trees on the corner of the street. They were always there. The distance between looking and seeing can be this great.

At the centre of this conversation sit people coming from six different disciplines – game design, cave ecology, agricultural diversity, botanical illustration, systems art, and entomology. All approach biodiversity from different positions, yet all encounter the same question: how carefully must one look in order to perceive what is being lost?

An educator takes children out into nature – but not to "teach," to "play." She has designed a game called the Nature Discovery Box: four times a year, seasonally, people in their own neighbourhoods spend five weeks observing, collecting, photographing. Then they send what they have found to a "secret friend" in another city – from Istanbul to Urfa, from Urfa to Istanbul. Four hundred people participate. Without play, there is no learning. But this game has no rules; it is a process open to unexpected discovery. Finding a leaf skeleton in autumn teaches autumn. A child recognising a smell, feeling the texture of a leaf, seeing the colour of a mushroom – this is not encyclopaedic knowledge but embodied knowledge.

"Without play, there is no learning."

From another vantage point, a botanical illustrator says the same thing: seeing can be taught. For more than twenty years she has been working on the Flora of Turkey project – a vast archive of twenty-eight volumes and nine thousand illustrations. Each drawing is linked to a herbarium specimen; every leaf vein, every petal is rendered with scientific accuracy. Photography cannot do this; illustration can encode taxonomic detail. But perhaps the most beautiful aspect of this work emerges in the workshops: there are no prerequisites, anyone can participate. Someone drawing a pomegranate notices the texture of its surface for the first time. People leaving the watercolour workshop say "I now see things I never saw before." The beauty of this project is that it requires nothing in advance – neither botanical knowledge nor drawing ability. Only looking, and looking with patience. To follow the veins of a flower's leaf, to see the gradation of colour at its edges. This is the democratisation of expertise.

But the Flora project also has its paradox. A twenty-year, twenty-eight-volume archive – scientifically magnificent, but who will read it? Technical language, taxonomic terminology, Latin names. The project breaks new ground in the scientific world but cannot reach the person in the street. There is also the orchid project in China: in response to the over-consumption of wild orchids, a travelling exhibition has been prepared at five major botanical gardens. Surveys measuring behavioural change before and after the exhibition are administered. Art can be the most powerful vehicle

for carrying knowledge. The documentation of Nepal's endemic medicinal plants follows a similar path: resources prepared with illustrations and texts are distributed across different regions of Nepal, changing how local people look at their own plants. Knowing changes looking.

"The difference between looking and seeing is bridged by attention. And attention can only be sustained with joy."

### SYSTEM, LIMITS, COMPLEXITY

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Between forty thousand and four hundred thousand caves are estimated to exist in Turkey. Only a thousand have been studied. A zoologist recounts descending into the world's tenth deepest cave at the age of twenty. The sensation of discovery. Entering an unmapped place, seeing something no one has ever seen. Returning to the same cave thirty years later, a sandcastle left by an explorer still stands perfectly intact — the cave freezes time.

But a cave is also a closed ecosystem. Everything is interconnected: bats hanging from the ceiling, guano falling to the

floor, guano feeding insects, insects feeding bacteria, bacteria feeding the soil. A colony — thirty thousand bats — eats

millions of insects each night. When you extract that guano, it is as if you have uprooted a closed forest. Recovery takes a hundred years, perhaps more. Yet guano is marketed as "organic fertiliser"; caves are exploited as if they were

mines.

Genetic diversity takes on a critical meaning here. When the climate changes, what survives is that which is diverse —

individuals with different genetic endowments can adapt to different conditions. A homogeneous population, by contrast, can collapse at a single bottleneck. Even the reproductive biology of bats demonstrates this: females can store sperm through winter and fertilise themselves in spring; lactation, migration and hibernation run simultaneously.

Nature has designed diversity not as a luxury but as a survival strategy. Genetic diversity is insurance: when conditions change, the most suitable endowment among the different ones within the population comes to the fore.

Monoculture, by contrast, is living without insurance — efficient when all goes well, catastrophic at the first bottleneck.

"Biodiversity is a knowledge system. The greater the diversity, the more responses are available to disruption."

And what if human intervention is itself a disruption? Entering a cave already damages its ecosystem — footprints, light, shifts in temperature. Ploughing a field changes the structure of the soil. Even drawing a plant requires sampling.

Every intervention leaves a trace. The only thing to be done is the most conscious intervention possible, at the lowest possible impact. With compassion. Upon entering a cave, ploughing a field, drawing a plant — knowing that the trace will remain, but that leaving no trace is also not an option. To live is to intervene.

The genetic sources of all Holstein cattle have been reduced to nine bulls. Nine bulls — the foundation of all dairy cattle genetics in the world. This is the most striking indicator of industrial impoverishment. A single disease, a single

genetic vulnerability, could collapse the entire population. The same logic holds for seeds, forests, corals.

## INDUSTRIAL DIVERSITY

The global food regime has narrowed to ten or fifteen principal crops. Local varieties are being lost – not for biological reasons but for economic ones. The market wants standard sizes, standard appearance. The Granny Smith

apple is the same the world over; but hundreds of local apple varieties from Anatolia cannot reach the stalls. The Çengelköy cucumber is a variety effectively extinct; the last seeds were found with an eighty-year-old gardener, but it had long since been "contaminated" through genetic cross-pollination.

A farmer works 180 dönüm of land by natural methods. Ancestral seeds – seeds passed down from generation to generation, adapted to that soil, known by their names. But tracing these seeds is detective work. "Hairless okra" brought from the Netherlands is sold as local. Patented varieties carry genetic markers; once planted, that marker persists across generations. Access to seed banks is restricted, institutional doors are closed. Seed trading can be deemed criminal. The distinction between genetic engineering and classical breeding is also blurring: patented seeds carry ownership markers that remain for generations once planted. The farmer, without even knowing it, has been using genetic material belonging to someone else.

"A seed is not merely a plant – it is a carrier of knowledge. Within that seed lies the experience of generations: which soil it favours, when it is planted, how it is harvested."

The seed exchange networks of village women are in fact a living knowledge system. Each woman keeps seeds from her own garden, exchanges them with her neighbour, passes them on to her daughter. When these networks are severed – when young people leave for the city, when supermarkets reach the village, when ready-made seeds become cheap – it is not only plant diversity that breaks down but the web of relationships that carried that diversity.

There is no comprehensive inventory of Turkey's edible plants – a resource like the Flora has not yet been produced for agricultural diversity. Agricultural research institutes once did this work; now they have either been closed or their archives sealed. The disappearing local fruit varieties of Muğla are being documented, but this is the resistance of a handful of people against market standardisation.

## WALNUT TREES AND DREAMS

Hundred- and two-hundred-year-old walnut trees are being felled in south-eastern Anatolia. Their wood is turned into veneer boards – elegant dining tables, office furniture. An artist visits one of these factories: a warehouse full of "walnut cadavers." She rescues discarded roots and transforms them into art objects. But the scale of the problem is terrifying: at the current rate, within one or two years there may be no walnut trees left in the region. The tight grain that the arid climate gives to walnut makes it both precious and fragile. The quality of walnut wood is highest in arid regions – tighter grain, more beautiful pattern. This quality makes it the target of industry: gun stocks, the pharmaceutical industry, luxury furniture. The older the tree, the more valuable – and the more irreplaceable.

This artist spent seventeen or eighteen years of her life in a village of twelve households. Animal husbandry, knowledge of the soil, water management, walling, pruning, cheese-making – all learned through living. Then she

moved to the city; she felt as if she had "gone to Mars." Now she cannot recall that knowledge. Her father's hands carry the mark of labour – her own hands are soft. This erasure of knowledge is irreversible even if practice were resumed. Embodied knowledge – what hands remember, what eyes recognise, what lungs know – cannot be learned

from books. Spending eighteen years in a twelve-household village produces a different expertise from eighteen years

in a university. And when the first is lost, the second cannot compensate for it. She draws dystopian urban images: two or three hundred buildings collapsed into a single mass, no human, no animal, no soil. To depict the sensation of arriving in Istanbul – "like going to Mars."

"However good I am, I cause harm. But if I am silent, there is more harm still."

She draws imaginary insects – anatomically convincing but non-existent species. Starting from macro photographs of real insects, she absorbs the detail, transforms it, recombines it. Perhaps placing imaginary species in the place of those that will be lost is a form of mourning. There are also the dystopian urban images: two or three hundred buildings collapsed into a single mass, no human, no animal, no soil. And a future project: a specimen catalogue of twenty or thirty imaginary insects, together with fictional narratives. Documented as if real – a natural history of what does not exist. Loss and imagination, two sides of the same coin.

## DIVERSITY ON OUR PLATE

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Why must we protect biodiversity? The simplest answer is functional: diverse systems are more resilient, homogeneous systems collapse. Every great famine in history was the consequence of monoculture. But there is a deeper question: do we protect biodiversity only because it is useful to us?

The human species is the final second in the twenty-four-hour history of life on Earth. But in this one second, the rate of species extinction has reached the highest level ever observed. The sensation that "the world is ending" is a Western anxiety; for colonised peoples, the world already ended five hundred years ago. Even the people of Göbeklitepe must have felt their world changing. Change is constant; but speed is new. And anxiety about "the end of the world" is experienced very differently depending on geography: those who give the loudest voice to this anxiety today are generally those who will be the last to be affected.

"As humanity, we are a single second. But in that second, we are erasing the accumulated knowledge of billions of years."

And here is the paradox: an artist drawing a flower is also an intervener. So is a researcher entering a cave. A farmer keeping seeds is also making a choice – what to keep, what to let go. We cannot look at nature "from outside" because we are inside the system. The only thing we can do is be conscious of this intervention. Not guilt, but awareness.

The question of rights is expanding: the rights of Syrian children, animal rights, water rights, land rights. When we use the language of rights, we are in fact establishing a moral relationship – we are attributing personhood, agency, to the

non-human. This is a projection, yes; but a projection with real consequences. When you attribute "rights" to a river, you create legal grounds for protecting it. While Edward O. Wilson proposes protecting half the earth, Emma Marris argues that this creates a false distinction that separates humans from nature. Perhaps both are right: both protecting

the distant and getting to know the nearby nature — the Ginkgo in your own neighbourhood — are necessary.

### EXPERTISES, GAMES AND DREAMS

A terrarium — a small living world inside a sealed glass jar — is like a miniature cave. The plant inside produces its own

humidity, breathes its own oxygen, completes its own cycle. But when the lid is opened, the equilibrium breaks. When scale changes, what is visible changes too: at the micro scale, the branching of a leaf vein follows the same pattern as

the branching of a river delta at the macro scale. There is a similar mirror between variation in industrial products and biological diversity. Difference, at every scale, is the fundamental property of the system. A blogger tries to convey plant evolution in a language requiring no specialist knowledge — why does the monstera leaf have holes, how do plants reproduce, how does a terrarium work. To build a bridge between research and narrative, to maintain scientific accuracy while also exciting people. She produces art projects in which animals and objects are used as "agents" to make everyday rituals strange — to render the habitual visible.

So where does expertise stand here? A twenty-eight-volume Flora, nine thousand illustrations — these are the work of specialists. But a workshop participant who sees a pomegranate truly for the first time is also an expert, in the expertise of their own experience. A child recognising a mushroom by its smell is also an expertise. The question is not

to separate these expertises from one another but to connect them.

"Between a child recognising the smell of a leaf and a botanist making a species identification, there is not hierarchy but continuity."

The Titan Arum — the world's largest flower — smells of carrion. Because it needs to attract carrion flies for pollination. Magnificent in photographs; impossible to stand beside. We romanticise nature, but nature is not romantic; it is functional. The chasm between Instagram gardens and real fields lies at the heart of the biodiversity debate too.

And perhaps this is the most striking difference of all: the gulf between how someone who has lived the weight of rural labour looks at biodiversity, and how someone watching a nature documentary in the city looks at it. The first knows that working the soil is extremely hard, that living with animals is very difficult. The second knows that green is beautiful, that nature brings peace. Both are right; but to translate between the two — just as in the water session — is perhaps the hardest work of all. Rural life is not romantic: operating machinery, applying pesticides, wrestling with infrastructure problems, wearing down the body. Without seeing this reality, dreaming of green is escapism. But within those dreams there is also a truth: to long for what has been lost is at least to be aware of the loss.

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Population pressure requires infrastructure – roads, hotels, dams. This is not a conspiracy; it is the functional consequence of migration. But it destroys an irreplaceable landscape. The transformation of the Çoruh Valley demonstrates this: the demands of tourism and settlement are erasing the valley's singularity.

The Ginkgo trees were always there. As we learn to look, we will see. But seeing is not enough; touching, smelling, playing, losing and mourning are also necessary. Biodiversity is life itself. And life encompasses play, discovery, loss, mourning, and beginning again. The sandcastle in the cave can stand undisturbed for thirty years; but outside, in our world, nothing waits. Not seeds, not walnut trees, not bat colonies, not the knowledge of village women. Do we have time? We do not know. But we can begin to look – to really look.