

# COUNTER

M A G A Z I N E

DIRT

ISSUE 1 | 2019

# COUNTER

M A G A Z I N E

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# ISSUE 1 | DIRT

Welcome to the first issue of Counter Magazine: a magazine that tackles the tough, taboo and beautiful topics of food. The spirit of the Magazine was conceived some seven years ago with a collection of people – food industry folk, designers, artists, researchers – who sat around a table in Petersham, Sydney, motivated by a simple vision for a magazine which delved into the magnificently complex world of food. And which did so in a way that is enjoyable but not too comfortable, challenging but not too serious, celebratory but not complacent, locally based but far reaching in case studies and topics.

The spirit of the magazine can be summarised by the word counter: as a verb it indicates a reaction to something that goes in an opposing direction, as a noun, amongst other things, it is a kitchen counter where food is served up, it also shares an etymology with the word encounter. We hope that Counter Magazine offers a platform for all of the above – to encounter ideas about food that diverge from the norm or issues that bring new light upon the intricacies of food; to present food in a less glossy way than dominant magazines; and to serve up intriguing stories or the occasional mouth-watering recipe. To do this we have brought together a mix of people who work with food in diverse ways: microbiologists, psychologists, chefs, food writers, journalists, gardeners, social scientists, and those who cross fields, such as Yuin, Bunurong and Tasmanian man Bruce Pascoe, who is an award winning author and also a farmer, teacher and fisherman. Together with our contributors we are not afraid to serve up a slice of contrary pie alongside a heartfelt story, scholarly essay or a juicy centrefold.

Why Dirt? The idea for an issue on dirt grew out of our first gathering and has captivated our imaginations ever since, as we hope it captures yours. Dirt exemplifies the complexity of food. Dirt can mean obscene and immoral, gossip. Dirt is life giving, earthy, nutritious. Dirt is an affront to our self or culture. Dirt grows food. As Andrew Geeves's says in his framing article "Dirt spans a formidable scope". We are truly inspired by the ways in which contributors have embraced this topic and presented such diverse ways to write about and to visualise dirt as it relates to food.

The Dirt issue has been a labour of love for all involved and we would like to thank the contributors and those who helped to conceive this magazine for their passion, patience and labour.

Our vision for the future of Counter Magazine is to produce a print magazine which sustains an exploration of food through complex, age-old and base themes, such as dirt.

**Kate, Tanja, and Dan**

**Editorial team**



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# dirt, n.

Andrew Geeves

Dirt underpins survival. Like the many lifeforms it helps propagate, dirt is unstoppable.

If it did not exist, neither would we.

Dirt evades clean definition. Metathesised from the word drit, which loped into Middle English from Old Norse, dirt is appositely messy in its meanings. The Oxford English Dictionary's myriad definitions of dirt include:

1. *Ordure; = excrement*
2. *a. Unclean matter, such as soils any object by adhering to it; filth; esp. the wet mud or mire of the ground, consisting of earth and waste matter mingled with water.*
3. *a. Mud; soil, earth, mould; brick-earth. colloq.*
4. *a. The quality or state of being dirty or foul; dirtiness, foulness, uncleanness in action or speech.*

Dirt spans a formidable scope. It is waste that sullies, loam that nurtures, or a composite substance sitting somewhere between these two polarities. The nearer dirt draws to the faecal end of its definitional spectrum, the more it is muddled with moral judgment. Earth that bears life becomes dross that threatens to tarnish irrevocably.

Dirt prompts discomfort. Its thrill is not without its edge. Picture a child who enthusiastically digs in the garden – serotonin levels increasingly bolstered by the *Mycobacterium vaccae* that organically laces the soil – before noticing with distress how dirt creates a stubborn grittiness that disrupts the smoothness of her hands. Dirt evokes reverence, fear or a confused amalgam of both.

Dirt is paradoxical. The removal of dirt serves only to make room for more to gather. We vigorously scrape, vacuum, sweep, scrub, polish, wash and tidy it away. Yet the very satisfaction we derive from cleaning rests on our understanding of this act as ultimately futile. The endpoint of cleaning is not an absence of dirt but a readiness for its inevitable return.

Dirt evokes ambivalence. It continues to return, alongside other parts of our experience that we try to hide or jettison from ourselves on account of the conflict, displeasure and shame they spark within us. Strong contradictory feelings underpin our relationship to dirt in both our external and internal landscapes.

## SPOILING / SOIL

Having a dirty mind, dishing the dirt, airing dirty laundry, talking dirty, digging up dirt on someone. Idioms abound in the English language in which dirt points to the clandestine, nefarious, scandalous and shameful. Dirt is wild and outrageous. It operates behind closed doors and under the cover of night, acknowledged through knowing glances, subtle nods, furtive winks and hushed whispers. Dirt is concealed for a reason. It is an effluvium that, given half the chance, will snake into the nostrils of unsuspecting

innocents, corrupting, contaminating and defiling their nobility. Dirt is ruinous.

“It’s about time that I came to start the party/Sweat dripping over my body/Dancing getting just a little naughty/Wanna get dirty”, sings Christina Aguilera on her 2002 single *Dirrty*, uniting self-initiated party starting, bodily function and titillating movement under the umbrella of getting *dirrty* [sic.]. In the accompanying video, arguably a key visual exemplar of raunch culture, a clammy, micro-skirted, crotch-grabbing, dreadlocked Aguilera gyrates in a subterranean wrestling ring, surrounded by similarly scantily clad onlookers on whom she grinds. Hades has engulfed the fresh-faced girl next door from Pittsburgh who burst onto the Billboard charts in 1999 with *Genie in a Bottle*, a song that the ex-Mickey Mouse Club troupe member touted as a clarion call for young women to maintain self-respect via enforcing boundaries around what they and they alone desire in early sexual relationships. Egad, see what dirt can do!

Excess characterised as waste, dirt is often tied to basic corporeal eliminative functionality. We seek to distance ourselves from that which our bodies discharge and from the process through which this occurs. Dirt is chaotic. We fear its re-entry. Physical and psychological boundaries are disrupted. Fluids, opinions, emotions and fantasies spill out uncontrollably. What was inside is now outside, what was self is now other.

But why the shame? Dirt’s salacious overtones and scurrilous capacity echo dynamics at play within the Christian doctrine of the fall. A thirst for ultimate knowledge leads Adam and Eve to disobey divine instruction. Yielding to the serpent’s temptation, they eat from the tree of knowledge of good and evil. *YOLO*. This purposeful act of defiance heralds sin’s entry into the world. For the first time, the couple become not only aware of their naked bodies but, significantly, ashamed of them. Expelled from the Garden of Eden, they are forced to downgrade from a lifestyle of immortality, plenty and harmonious co-habitation to one of toil, hardship and conflict that waits outside the Garden’s guarded entrance. Amongst the many punishments metered out to the couple by their creator is the following: “You will have to sweat to earn a living; you were made out of soil, and you will once again turn into soil” (Genesis 3:19; CEV Bible).

As the fall narrative testifies, we have long struggled with the challenge of accepting that a body ripe with potential for so much more than base function – for creativity, relationship, generativity, thinking and interaction, for example – remains anchored in it. In the fall narrative, the everyday bodily function of perspiration is fashioned into a proxy reminder of humankind’s ongoing connection to dirt across the lifespan, of our constitutional baseness and mortality. Humans are of the dirt, bodies are of humans, dirt is of the body; or so the (moral) reasoning seems to go. This is a sad state of affairs, for we cannot but be found in a body, replete with its constant erring towards

squalor. No wonder we're shame saturated. We bleed, piss, shit, fart, ooze pus, ejaculate, sweat, fly off the handle, sneeze, shed skin, vomit, expectorate and yell, all without trying very hard (and often before lunch). We fear our inherent, inescapable dirtiness, despite – or perhaps on account of – it consolidating our place in the natural world.

## **GROUNDING // EARTH**

While dirt has been used as a synonym for excrement since the 14th century, it was not until the end of the 17th century that the term started to be used to refer to earth. Wired for survival, we are slower to recognise that which we find less alarming.

For dirt is not all bad news. Framed as earth, dirt stabilises, settles and centres, qualities conveyed through expressions such as feeling grounded, being down to earth and having both feet on the ground. Dirt demands authenticity. “My recipe for life is not being afraid of myself, afraid of what I think or of my opinions”, said entertainer and activist Eartha Kitt, “I’m a dirt person. I trust the dirt. I don’t trust diamonds and gold”. Dirt is honest, reliable and trustworthy. It begets humility. No one can be too proud in the face of dirt.

The oxygen we breathe and food we eat relies on dirt. Personified as Mother Nature and as Gaia and Terra/Tellus Mater (and other, frequently female, deities), earth/dirt embodies essential life-giving attributes often ascribed to maternal instinct such as care, provision, fertility and nurturance. The containing function of dirt’s virtues, then, feels oddly familiar. The good mother. Nestled in her bosom lies the infinite promise of abundance. Dirt is comforting, secure, edifying, generative, wholesome. In dirt, we find home.

## **RECKONING /// GROWTH**

What to do with dirt? How do we reconcile our relationship to something that can elicit terror and contentment, shame and comfort and can make us feel both tainted and complete? Essentially, how do we sit with the good and the bad?

Denying the need for any sort of reconciliation is one way of approaching this conundrum. The problem is solved by disavowing its existence. An either/or split is created. There is good or there is bad, terror or contentment, shame or comfort. One hand holds earth, the other excrement and never the twain shall meet. The hours we invest attempting to eradicate from our







Image: Lucien Alperstein

everyday lives their inherent messiness demonstrate our distaste for it. The very human need for order – linked closely to survival-based yearnings for environmental predictability – breeds in all of us the fantasy that cleanliness is next to godliness.

In *Freud and Beyond: A History of Modern Psychoanalytic Thought*, psychoanalysts Stephen Mitchell and Margaret Black describe a patient they name Rachel whose mind is characterised by such marked separations:

*As far back as [Rachel] could remember, she had felt tormented by two vivid and intense images and their relationship to each other...The first image was of tiny, extremely delicate flowers. The second image was of enormous humanlike figures, menacing, without features, composed entirely of faeces. The two images were bound together in a way she did not understand...She would think of the flowers and then the shit people, then the flowers, then the shit people...Central to her sense of the impossibility of their merger was her dread that such an integration would*

*result in the destruction of the delicate, vulnerable flowers; they would be submerged and buried forever under the massive, ominous shit people...she could never resolve the tension posed by their intense polarity.*

Rachel's fear about the ruinous effect the shit people might have on the flowers prevents her from being able to hold them both in mind at the same time. She erects a psychic partition that separates her knowledge of the existence of one image from her knowledge of the existence of the other. The creation of a dichotomy appears to dissolve the intrinsic conflict of a dialectic.

Splitting is not without its appeal. Yet not only is the hard work it requires unsustainable, it inevitably results in suffering. In *The Examined Life*, British psychoanalyst Stephen Grosz tells of a woman whose Jewish father threatens to disown her when she marries her blond, Catholic husband, only for it to emerge years later that this same father has been having an ongoing, decades-long affair with his blonde, Catholic receptionist. 'The bigger the



front, the bigger the back', states the woman, summing up her understanding of the situation with a pithy maxim.

It comes as no surprise when a pastor from the Deep South who rails virulently against the evils of homosexuality and associated vices of contemporary culture eventually owns up to accusations of involvement with rentboys and smoking crystal methamphetamine. The bigger the front. We've all been there to some extent. Such processes, sometimes with less extreme repercussions, are readily observable in everyday life. We wall off what we like about ourselves from what we don't like about ourselves. We promote the good and delight in our ownership of it. We conceal the bad from others and from ourselves, often projecting it out into the world. "I'm not racist, but..."

A recurring theme in psychotherapy is just how difficult it is for us as humans to tolerate ambivalence. Holding two conflicting ideas in mind is difficult enough, let alone any attempts at integration. It is uncomfortable to entertain the notion that the very same partner whose key point of attraction is their strength is also vulnerable; that, despite our best efforts, our actions can contravene our values; that the parents who raised us were not immune to human fragility, and possessed both strengths and weaknesses; that life is precious but does not owe us anything; that we are capable of loving, hating, creating and destroying in equal measure and often within the same relationship.

Sitting with the tension of a dialectic and attempting to integrate ambivalence may provoke discomfort. But this both/and approach carries a potential for movement that is in stark contrast to the stagnation of splitting. Mixing excrement with earth produces fertilised soil ripe for growth. Yet such an act of synthesis demands courage. It requires faith in the possibility of novelty, change and transformation and confidence that the good will be able to retain its 'goodness' in the face of all the 'badness' of the bad to which it will be exposed. In relation to the shit people and the flowers held so strongly apart by Rachel, Mitchell and Black write:

*The belief that one's love can survive one's destructiveness, makes possible the integration of love and hate into richer and more complex relatedness... the flowers and shit people can be integrated only if Rachel can believe that the flowers will emerge from underneath the shit...that the shit will fertilise new and stronger growth rather than bury all signs of life.*

Our past experiences with goodness and badness – both that to which we've subjected others and that to which we've been subject – are going to affect the strength of our courage, faith and confidence in the face of this process. We all need support in this process, some more than others. Welcome to therapy.

"All who wish to be more noble-minded than their constitution allows fall victims to neurosis: they would have been more healthy if it could have been possible for them to be less good", writes Sigmund Freud in his essay *Civilised Sexual Morality and Modern Nervous Illness*. Tempting as it may be to read Freud as the philosopher of the one-night stand here, the point he is making is actually much more finely nuanced. The more able we are to concern ourselves less with being good – and with being bad, for that matter – the better off we will be.


Life is not about being good or being bad. Dichotomies breed neurosis. Dirt is of us, in us, through us. Fearlessly and

unashamedly delighting in its messy reality allows us to share in its life-affirming riches. "Like sunflowers whose suns are hidden, we see ourselves turning in all sorts of directions, often at once", writes Adam Phillips. We are a shambles of contradictions and inconsistencies. Yet, once we accept that our lives could never fall neatly into a spreadsheet, the chinks in our armour can become more attractive than its sheen. We realistically acknowledge our potential and our limits, taking the good with the bad, giving both equal weight, owning both and moving forward from there. The shit people fertilise the flowers. Something new emerges.

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**Dr Andrew Geeves is a clinical psychology registrar in private practice and a sessional academic. He feels dirt is underrated.**





Dehesa and Matanza. Two words that encapsulate multiple meanings, existing together and not possible without each other. They represent history, geography, culture and soil. The Dehesa, spiritual home to the Pata Negra jamon for over 1000 years and the Matanza, a yearly ritual of preserving the revered meat from these elegant sows, would not exist as we know it if it weren't for the interdependence between farmer and pig. Sculpted by time and the swines' snouts this fertile and rugged terrain exemplifies our ability to respect and nurture "terra". Whilst providing an abundant bounty, the land is maintained, renewed and passed on for the future with deep memories of the past in mind.





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Luke Burgess is a cook and aspiring green thumb who can't resist the allure of culture, travel and history.







# Terroir, it's not a Dirty Word

*Libby Travers*

To taste a foreign land in the glass, to taste the terroir, while concurrently being transported to the year it was made – a time capsule of sorts – is tantalising. But is this just a fancy marketing ploy, or is there truth to the idea?

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It's the end of vendange, or grape harvest, in the Loire Valley. While the industry is serious – as one wine maker pointed out to me, the ten days of picking largely shape the year ahead for his family and finances – there is also a sense of tradition and conviviality that accompanies the work. Friends will join the grape harvest and the days are punctuated with meals, with wine, with conversation. The collection of people ranges from old family friends to sommeliers, to chefs, to gypsies. A motley crew. It is as it has been for centuries.

The work is hard on the body – I found muscles I didn't know existed – but the methodical, repetitious nature of the work is cathartic in a way. Your senses are in overdrive as you smell, taste, touch, and look at each bunch – like eating and making love, it is work that employs so many senses at once it is hard not to find it romantic.

And yet, I did not necessarily come for the wine (although that has been a happy coincidence), nor the company (which was equally delicious), but rather to understand the impact of the soil beneath my feet and its impact on the grapes in my hand. I am seeking a better understanding and definition of terroir, the deliciously sentimental idea that you can open a bottle of wine and be transported to another place.

I have long been fascinated with the idea, but find the definition like pinning down a wave. It's constantly moving and evolving and everyone appears to have a different answer.

The concept of terroir dates back at least as far as the Ancient Greeks, who would stamp the names of the regions on their amphorae. In a more official capacity, it was in 1716 that Chianti was recognised as a designated region for wine production. And yet, it was the French who were the first to realise the commercial value of this romance – something they are pretty good at in general – and they have subsequently sold the idea of their unique terroir to the masses via their wines, cheeses, hams and other agricultural products.

Derived from the Latin *territorium*, literally meaning land, the concept of terroir is based on the belief that tastes and flavours can be imparted into wine (and indeed other produce and products) from its place on the earth. Beyond geography, this can include many and varied influences, from the structure and composition of the soil beneath, to the orientation toward the



sun above, the climate of the region, but also the way the wind passes through the vines, the distance above sea level and indeed, the human hand.

The concept is as complex as it is marketable. As regions became synonymous with the quality of a specific product, they did so to the exclusion of all others: Champagne can only be made in the region of Champagne, Roquefort in Roquefort, Bayonne ham in Bayonne.

It was not long before certification systems were created to stipulate the terms and uniformity of the region's specialties. These include the Appellation d'Origine Contrôlée (AOC) in France, the Denominazione di Origine Protetta (DOP) in Italy, or the Denominación de Origen (DO) system used in Spain – many of these are now also rolled into the European Union's system. These protected regions have come to exist the world over: Mezcal in Mexico, coffee in Columbia, Xuanwei ham in China.

For many of these systems, terroir is first defined by a geographic boundary, however the work of the appellation body goes much deeper. It will often also determine the variety of grapes to be used in the blend and sometimes even the vinification techniques – in search of a uniformity of product. The wine is then subject to a taste test, to ensure it shares the flavour profile of other products within the protection.

And this is where it gets interesting for producers such as Sebastien Riffault, whose grapes I am helping to harvest in Sancerre, a region that joined the AOC in 1936. Riffault, still considered by many as a renegade of the wine world, makes wine with minimal intervention; he is a believer in the power of the soils over the power of sulphur. Drawing on his wife's Lithuanian heritage, Riffault's wines are labelled for the earth beneath; they carry names such as Akmeninė (meaning "made of stones" in Lithuanian, a nod to the limestone plates beneath his vines) and Skeveldra ("stone fragments" named for the silex or flint fragments in that particular parcel).

This minimal intervention or "natural" wine making is about organic and biodynamic principles in the vineyard, carried through to the winery. As a lovely sommelier, picking with me that weekend, concisely explained – it really comes down to a very simple formula: nothing added, nothing taken away: no pesticides or chemicals added in the vineyard, no sulphur (or, at least minimal sulphur) or flavours added in the winery, no filtering or fining to remove anything from the bottle. It would be easy to assume this kind of wine reflects the land beneath, and yet it is the natural wines that seem to be causing the controversy.

While the French were the pioneers when it came to selling their unique terroir, they also appear to be the worst at adapting to new market ideas and demands. What started as a clever branding tool has slowly created a stranglehold on producers. By upholding a status quo of the region's wine based on the way it was manufactured when the appellation was created, they fail to allow for evolution; there is no scope for creativity or adaptation. Perhaps worse than that, the idea is dictated by that one point in time, generally depending on the date the appellation was created (many created after WWII, when the use of fertilisers and pesticides also became the norm). Some see the result as a McDonaldisation of the wine world, where you can seek comfort

in knowing that a wine will taste a certain way based on its appellation, but somewhat lose the romance of the unexpected in the glass.

Between the days of picking, I was particularly fortunate to spend a little time with Alexandre Bain. His vines are only a few kilometers down the road – somewhere on that winding French road I had crossed an invisible line from the AOC of Sancerre to the AOC of Pouilly-Fumé – where the wines, both made with the sauvignon grape, are said to change; minerality replaced with a denser wine, often holding more citrus notes.

Alexandre is a beautiful man, a sense you got the minute you walked through his threshold: a great storyteller as well as a great person. Despite seeing all of this in the first minutes, I was not prepared for the morality, principle and spirit evident in his story of terroir and the AOC.

Alexandre's wine is not overly funky or crazy in the glass, a criticism levelled at many natural wine producers. In fact, they are really the embodiment of this lovely, thoughtful and conscientious man. Above all, without any doctoring, they are what I would consider the very embodiment of the terroir. Despite all of this, the governing body of Pouilly-Fumé found his wines did not portray their idea, their status quo, when it came to representing the region – a number of his wines were relegated to Vin de France (VDF). And then, citing a missed inspection, they kicked his wines out of the appellation altogether in 2016.

Affronted, Alexandre took them to task and fought them in court. As you can imagine with French bureaucracy, this was no cheap exercise. He won the court case, but lost a decent sum of cash in the process. This year, as the appellation body has been calling him to find out which wines he wants to include, he has politely, but firmly, told them non, merci. It was a battle won on principle, but a system he now wants no part of. In his cave, the Pouilly-Fumé title is crossed out, VDF (Vin de France) carefully written underneath it.

The argument is a very valid one – these products and their regional specificities existed for hundreds of years before the Frenchies slapped a label on them. Roquefort, the first cheese to be granted AOC status in 1925, was based on a process of maturing sheep's milk cheeses with the aid of an indigenous mould found in the caves near the town of Roquefort. People have been maturing their cheese in these caves as far back as the 1500s.

The impact of the climate and topography on terroir is a relatively simple concept to grasp, however many believe the soil is also integral, if not the most important aspect. It also remains the great unknown. Much of the evidence of its impact is anecdotal – do the ancient oyster beds and crushed shells in the region of Chablis lend minerality and a taste of the ocean? Does the silex in the soils of Sancerre add buttery characteristics to their wine? Many scientists say no, but it is hard to refute the evidence that a trained palate can identify these tastes in the glass.

"I would suggest that impact of the soil is to a great extent, unromantically, about water retention and its impact on grape flavour," says Sydney-based wine writer and co-founder of Rootstock Sydney, Mike Bennie "Clay gives richer flavours based on water retention and being able to feed each berry, where slate



less so, rather providing more acidity and a sense of minerality, based on free draining nature of soil.”

Beyond its composition, soil is a complicated organism – one handful of healthy soil will hold more living organisms than there are humans on earth. In a similar manner to our own microbiota – the forest of bacteria that exists within our gut helping to digest food, fight bugs and even disease – the intricacies of the soil’s ecosystem are largely a mystery. The importance of this forest of bugs within us, not just to our physical health, but our emotional and mental health, is only just being uncovered. And so, while we have long understood the idea of a “gut feeling,” what if this is more than conceptual? And if the bacteria that exist within us can have that effect, what of the bacteria in the soils?

In today’s world, if we can’t measure it we tend to dismiss it. Like gut health, logic has told us terroir exists, but science may be yet to catch up. In the world of “natural wine”, where the intervention both in the field and in the winery are kept to an absolute minimum, the idea of terroir is important. Without pesticides or fertilisers, it is the health of the soil that enables life. It was the French culinary philosopher Brillat-Savarin who developed the idea that you are what you eat. But you are also what you eat, eats – an idea that is as applicable to a grape drawing nourishment from rich healthy soil, as it is to a cow drawing from lush grasses (which, of course, also draw in their turn from the soil.)

The definitional problem does not end there. Is terroir the taste of the land, the climate or perhaps – most controversially – people behind it? “Most definitions of terroir rule out human intervention as part of the equation. But could winemaking play a role in maintaining typicity?” asks wine writer John Goode. “Certainly, in the classic Old World regions where terroir is so precisely delineated, the fact that winemakers commonly use similar techniques could help lend a distinctive regional style. Winemakers could also be adapting their techniques to best exhibit regional differences in their wines. This typicity, which owes more to human intervention than it does to classical definitions of terroir, is still of merit, as it helps to maintain the sort of stylistic regional diversity that makes wine so interesting.”

The winemaker’s hands will play a role, from trellising style to when the grapes are picked and the vessels they use, however, this can also reach beyond the manual to vinification techniques that have become synonymous with certain regions.

“In Europe,” says Bennie, “we may look to some of the oxidative wines of the Jura, or in Australia, where avant garde wine makers, such as the community in the Basket Ranges, are looking around the world for inspiration and techniques; from the soft punch downs of the Loire to the carbonic maceration of the Beaujolais.” Is this a case of wine making trumping the terroir, or is this the terroir itself?

Of course, culture and consumption should not be viewed in a vacuum. As knowledge is passed from person to person the approach to the land changes, so too the approach to the manipulation of the products. Wine-making techniques can be specific to an area as friends experiment together with the best way to enhance the beauty of what grows in their soil. This too, should not be discounted. It is not just the family who put it in a bottle, but their region, their culture.

These lands are tended by humans, by communities; they are tamed and moulded by local knowledge. Surely the impact of our hands and mind belongs in the mix? It can be argued, particularly with natural wines, that the flavours and perfumes in the wine are as much about the personality, the person who wrangled the flavour into the bottle, as they are about the terroir. It is also perhaps the way it always was. With no room for innovation, many of the new “natural” wines are now doing as Alexandre Bain did and using the label “vin de table” as they don’t conform to the parameters of the masses.

In a recent gathering of global food and wine minds for the 50 Best, Joan Roca described gastronomy as the landscape in the saucepan; conversely, Massimo Bottura suggested the key ingredient in his food is culture. Looking to the wines of both Riffault and Bain, it is in that combination that we find the true definition of terroir – a taste of the place and the people.

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**Libby Travers is a food writer with a focus on advocating food and wine that is produced sustainably alongside the importance of conviviality at the table.**











Image: Tarwyn Park Training

# **Legacies from the Land:**

## ***Joining the Dots of Regenerative Farming in Australia***

*Kate Johnston & Gary Cox*

Dirt is under pressure to perform like never before. There is an expectation that by 2050 food production in Australia can be doubled.<sup>1</sup> The CSIRO states that if we are to meet that demand globally we have to produce as much food in the next 40 years as we have in the past 500. It's an ambitious goal set while the area of arable land in use is shrinking, just six percent of Australia in 2015 according to the World Bank.<sup>2</sup>

At the same time competition for different uses such as timber, fibre, mining, energy, housing is growing. In short: less land will have to produce more food than ever before. The expectation is that the available arable land won't just feed Australia but will maintain an export industry, or as the Australian Federal Government under Tony Abbott put it, to help address global food security.<sup>3</sup>

Indian scholar, environmental activist and food sovereignty advocate, Vandana Shiva, stresses that:

*Everything we are is made of the soil. The food we eat is the produce of the soil. If we declare war on soil itself, if we ensure the fertility through which human species can continue is robbed of soil, then we are literally committing a species level suicide.<sup>4</sup>*

This point is not being dismissed simply as the alarmist mantra of activists.

The United Nations has just declared the next 10 years “The Decade of Landscape Restoration”. It aims to massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity. In 2013 the UN General Assembly named 2015 the International Year of Soils to promote awareness of the importance of soil for food security.

## RESTORE THE SOIL: PROSPER THE NATION

In 2012 Australia's Gillard government appointed the country's first Advocate of Soil Health, Major General Michael Jeffery. The former Governor-General and high-ranking military officer assessed the problems in Australia for five years before detailing an impending soil and water crisis in a report using the language of an imperiled national and global security.

In his 2017 report titled *Restore the Soil: Prosper the Nation*, Major General Jeffery says:

*I believe that soil and water security will increasingly underpin global social stability and security. Soil is a critical national strategic asset, and it is surprising to me that the scientific advances of the last 20 years in understanding the role that soil plays in each of these challenges have only recently been recognised.<sup>5</sup>*

State, Territory and Commonwealth Governments have developed a National Strategy for Soil Research, Development and Extension but there are currently no state or federal soil policies anywhere in Australia to leverage those scientific advances. The NSW Government's Department of Primary Industries (DPI) says it has a large (\$27 million) investment in soil-related research and development but the DPI has told *Counter Magazine*: “There isn't currently any policy, nor is any currently being developed.”

But the DPI's own research suggests a soils policy is within reach:

*Despite several key reforms in recent decades, the governance of soil in NSW remains somewhat disparate, scattered across a range of agencies, strategies and legislative instruments. There is no unifying up-to-date soils policy; nevertheless, there are some progressive initiatives that indicate this could be developed in the near future.<sup>6</sup>*

In a bid to address that “disparate” and “scattered” approach, Major General Jeffery has founded *Soils for Life*, a network for the growing number of innovative farmers and land managers who are presenting case studies for successfully regenerating their landscapes while maintaining or increasing their production. This is referred to as regenerative agriculture.

While writing his report he spoke to six thousand farmers to gauge their priorities.

“I think what they would like is to have a consolidated plan put to them. Firstly, the case studies which I want to see as a long-term research base on what works in our soils – microbial, fungal, nutrient function – water hydrology, plants and biodiversity.

So those case studies become the long-term research base, maybe even permanent but the second ingredient is developing a national policy,” he explains.<sup>7</sup>

Protecting soil as a “critical national strategic asset” is a real challenge. It will affect what there is to eat, where we go to get it, and the lengths our farmers will have to go to in order to bring it to the table. While that challenge may be clear, how to go about addressing it is at best a work in progress. Throughout the 20<sup>th</sup> century evolving legislative frameworks were largely reactionary. In the 21<sup>st</sup> century successful models of soils governance will hinge on a concerted strategic investment in research and development. As a citizen of the driest inhabited continent on earth, Major General Jeffery has raised the alarm: Australia will need to take stock of what we've learnt about agriculture across the continent and share the successes of what is currently working on farms today if we are to meet this challenge.

## ANCIENT, WEATHERED AND INFERTILE?

Dirt might always be there underfoot but productive soil is considered a non-renewable resource. One that can disappear. When it does, essential ecologies can disappear too. Soil is by far the most biologically diverse material on Earth. “Soils are home to myriad microorganisms that fix nitrogen and decompose organic matter, and armies of microscopic animals as well as earthworms and termites. Soil is our life support system”.<sup>8</sup> Soil provides anchorage for roots, holds water and nutrients, stores carbon. But soil takes nurturing and maintenance if it is to keep providing that life support.

Getting Australia's soils to perform presents a unique problem. While Australia has some areas of highly fertile soils, farmers and policy makers have long understood our soils as “ancient, weathered and infertile by world standards.”<sup>9</sup> We live in a land prone to drought, fire, and flood. Our soil is often poorly structured and affected by salinity, sodicity (sodium content), acidification, and low carbon, and in some areas is severely degraded by wind and water erosion.<sup>10</sup> But the issue is not just one of poor pre-existing conditions with which farmers have to contend. It is an issue of ancient and evolving farming methods



and sharing existing innovations in land management.

Peter Andrews, his son Stuart Andrew and Duane Norris are already sharing some of those methods and innovations at The Mulloon Institute. Together they run Tarwyn Park Training, named after the iconic Hunter Valley property where Peter pioneered the principles of Natural Sequence Farming (NSF). They offer ‘hands on’ workshops on how to redesign farms to maximise productivity and landscape function, while minimising costs. Their mission: rehydrate Australia.

Duane Norris says looking at the problem of Australian soils as “ancient, weathered and infertile” is missing the point. “The premise that it all comes down to soil health is a nonsense. It’s water. You need the water and the minerals that it carries. No water, no plants. No plants, no carbon. Farming water is the most important thing we can do. We recognize that. Aboriginal people recognised that,” Duane explained to *Counter Magazine*.

“Soil farming is really soil mining, mining for carbon. We deplete the fertility, we deplete the carbon. We probably started out with 18% carbon in the soils, then it went to between seven and nine and now it can be down to one percent.” He says natural sequence farming has proved that if you get water through your property, it can be 100 to a 1,000 times more productive. “This is an old landscape. There are flood plains across the country. There was water in grass-covered dams. Production was huge. They [Aboriginal people] were effectively growing in water.”

“Aboriginal people could farm with a stick, push it down a metre to get their yams in but today you can’t do it with a D9 [bulldozer]”.

Bruce Pascoe’s compelling book *Dark Emu BLACK SEEDS: Agriculture or Accident?* debunks the established narrative that Aboriginal and Torres Strait Islander Australians were hunter-gatherers and not farmers. His exhaustive research uses colonial settlement documents as pre-settlement evidence of vast fertile gardens, farming crops in abundance. It also records their demise.

Pascoe writes: “Colonist Isaac Batey, when commenting on the disappearance of the yam daisy, remembers women harvesting and washing tubers in vast quantities. However soon after his arrival in 1846 he notes:

*Where once abundant, they have become quite extinct for the district where the writer was raised in this 1909 might be searched without discovering a solitary example. Elsewhere it has been intimated that our domestic animals had eaten them out, yet there was another factor of destruction in the soil becoming hardened with the continuous trampling of sheep cattle or horses.*<sup>11</sup>

Isaac Batey also recorded seeing evidence of terracing, while first settler GT Lloyd recorded seeing orchids, lilies and mosses flourishing among the grain crops.

“The ground had been so protected by the mosses and lichens so thick that it was difficult to ride across the country at any pace exceeding a ‘farmers’ jog trot.”<sup>12</sup> Pascoe makes the point that Lloyd’s horses sank to the fetlock into the soil as if it were sponge.

Natural Sequence Farming has shown that recreating similarly fertile landscapes is possible and it has been attracting attention. NSF has been showcased on *Australian Story*, broadcast to a

national audience of three million people. Successive prime ministers, agriculture ministers and National Party leaders have heralded NSF. Peter Andrews has been celebrated “a real leader and visionary” for turning unproductive land around. In 2018 Deputy Prime Minister Michael McCormack declared the success of the Mulloon estate as a “model for everyone”.

“This needs to be replicated right around our nation. A nation that looks after its soil, looks after itself,” he said.<sup>13</sup> This ‘model for everyone’ was awarded a \$3.8 million grant for its project to rehydrate Australia, improve the environment, boost farm productivity and engage the community. A 2018 survey<sup>14</sup> of graziers using regenerative farming practices demonstrates similar potential. On profitability, ecological and wellbeing (mental health) criteria these farmers fared better, even in years of drought. But despite the funding, Duane Norris laments that the message is not getting through. “Like that young girl [Greta Thunberg] said, the house is on fire. It’s a national emergency and we have got to do something about it. We are just tinkering at the edges, it’s a waste of time”. Norris told *Counter Magazine*.

*We need to put vast amounts of plants in the ground to retain water. Most of what we’re doing to the country is actually making it worse. We’re still damming it, burning it, using exotic hard hooved animals ... It’s like [Canadian activist and author] Maude Barlow said in 2010, Australia is not in drought, Australia is drying out.*

## PAINFUL LESSONS, LASTING IMPACT

Almost 100 years ago it was already apparent – productive soils were disappearing. In the early days of Federation the goal was to increase land use and develop primary industries. Lessees were encouraged to make ‘improvements’ on a land that was assumed as terra nullius – nobody’s land, in need of cultivation. But by 1935 it was recognised that colonial land use practices were having a severe impact. Widespread degradation of soils, especially on grazing and farming land, were reported by the newly -appointed Erosion Committee.<sup>15</sup> Newspaper accounts of droughts and dust storms in southeastern Australia between 1895 and 1945 suggest that, at times, the scale of these events was comparable to those experienced in the USA Dust Bowl.<sup>16</sup> In Australia, by 1938 the Soils Conservation Act was passed and the Soils Conservation Service established. Action was being taken. Or was it? The SCS remained largely inactive until 1947 due to the war, after which time it established research stations and offered technical and financial support to landholders until it ceased to exist in 1991. Since 1987 the need for a national policy has been considered by governments on several occasions to no avail.

## GOLDEN SOIL A DWINDLING WEALTH FOR TOIL

We now know Australian soils are vulnerable to erosion and other forms of degradation and this vulnerability is exacerbated in times of drought. Farmers beating the odds to survive drought in a sunburnt country is part of a proud national narrative. The Federation drought (1895-1903) and the World War II drought (1939-45) are listed as the worst in south-eastern Australia’s history. Droughts may be accepted as part of life on the land but when it comes to managing the relationship between drought and dirt, Australian farmers have learned the hard way. And they are still learning the hard way. According to Melbourne University researchers, the 2018 drought is the worst in 400 years.<sup>17</sup>



One of the lessons has been that water stress from drought can affect soil chemistry and physical and biological activities, disrupting the entire biological system. Drought and overgrazing together conspire to create the conditions for accelerated levels of erosion.

“During extended dry periods the soil surface and even the lower profile, becomes desiccated and protective ground cover is reduced or entirely removed, especially if grazing by stock continues.”<sup>18</sup>

## LET IT RAIN

In times of drought farmers pray for rain but it can be both friend and foe. After long dry periods, when it does rain again, bombardment of the soil surface and high water runoff create a real soil loss hazard. “Long term research at six former Soil Conservation Service Research Centers shows that 90% of soil loss from runoff plots comes from only 10% of runoff events, and was almost entirely confined to periods when groundcover was below 50%.”<sup>19</sup>

Drought and/or overgrazing creates the conditions for such damaging levels of erosion to occur. Soil loss by water erosion increases exponentially when ground cover is reduced. But crucially, ground cover thresholds have been identified and they vary according to location. For example, in central and eastern NSW it's 70% while on the Western Plains the threshold is below about 40%.

*When topsoil is lost, it takes with it the best part of the soil for plant growth, as well as nutrients, organic matter, fertiliser and seeds. Often the exposed soil remaining has a much lower water infiltration rate, so subsequent runoff increases and the amount of soil water available for plant growth is reduced. Reduced nutrient levels also decrease subsequent plant growth.*<sup>20</sup>

After drought, many soils will be in a different condition to what is considered to be their normal condition. Some will be bare and powdery on the surface, some will be further eroded by wind or water, and some will have higher levels of nitrogen (N) and phosphorus (P) than expected. Loss of effective ground cover, due to grazing or cultivation, leaves the soil highly prone to erosion by wind and water. History has proved that drought, overgrazing, and then the return of rains can conspire to devastate the existence of productive soils.

## LAND OF SALT

Salinity is one of the most widespread agricultural problems in Australia. It has been dubbed a slow motion crisis<sup>21</sup> and is a problem that directly relates to how we manage land within the drought/flood cycles of the Australian landscape. Soil salinity occurs when the water table rises, bringing natural salts to the surface. The salt can accumulate and become toxic to most plants. “A primary cause of surface soil salinisation in Australia has been extensive land clearing, predominantly for agricultural purposes. This has allowed saline groundwater tables to rise, bring salt closer to the surface.”<sup>22</sup>



Saline wheat belt near Banniss, WA. Image: CSIRO





Salinity at Bruce Rock WA. Image: CSIRO

The growing problem of salinity serves as a good illustration of the frustrated relationships between farmers, scientists and government. It highlights how a problem can be identified and become well understood but not adequately addressed. Like the problem of erosion, we have known about salinity since the early 1900s but it wasn't until the 1970s that any action was taken.<sup>23</sup> That history appears to be repeating itself today.

By the early 2000s, 5.7 million hectares of Australia were assessed as having a high potential to develop salinity<sup>24</sup> with 20,000 farms and 2 million hectares of agricultural land showing actual signs of salinity. Prime Minister John Howard's Salinity Action Plan attracted \$560 million in federal and state funding but it left farmers wondering how that money was spent. "It's a scandal, at least \$300 million just vanished and they handed back \$40 million of it because they couldn't work out how to spend it," an exacerbated West Australian farmer, Max Hudson, told *Counter Magazine*.

Max Hudson has been farming the WA Wheatbelt for fifty years, and has been battling salinity since 1997. More than two decades later, the problem nationwide is worse than it has ever been. "Predictions indicate that unless effective solutions are implemented, the area affected could increase to 17 million hectares by 2050, 64% of which is agricultural land."<sup>25</sup> If that date sounds familiar, 2050 is the same year Australia is expected to achieve the goal of doubling food production.

Australia is starting to understand how bad farmland salinity is likely to become. There are also alarming indications of how much it is already costing. "Costs to the community associated

with soil salinisation in Australia are very large, estimated to be in excess of \$300 million dollars per year in the Murray-Darling Basin alone."<sup>26</sup> Australia's biodiversity is also paying a price. Areas of remnant and rehabilitated native vegetation are under threat in Western Australia, South Australia, New South Wales and Victoria.<sup>27</sup>

The impact and the figures around Australia, though, are dwarfed by statistics from Western Australia's agricultural areas. The available figures from the Wheatbelt are alarming but perhaps more alarming is that they're 10 years old. Dryland salinity has not been measured or recorded there for a decade. The 2009 data showed that almost all of the 2 million hectares of farm land directly affected by salinity were in Western Australia. In the Wheatbelt, salinity has also caused a 50% decrease in the numbers of wetland bird species, and 450 plant species are threatened with extinction through salinity.

In a damning rebuke of government inaction, a 2018 report by the Western Australian Auditor General found salinity monitoring has effectively stopped and that agencies do not know how effective the \$560 million investment to combat salinity has been. It also warns that over the past decade the problem may have doubled in size.

*The scale of the problem is daunting, but so is the scale of the action that would be needed to eliminate salinity. It would require re-planting 80% of the Wheatbelt, a huge task, requiring significant investment that would make broad scale agriculture, as it currently exists, impossible.*

But according to Max Hudson, who established the Wheatbelt

Catchment Alliance (WCA), three-quarters of the unproductive land could be recovered in the long-term at a cost to the government of just \$27.5 million.

The WCA covers six major drainage regions in the Wheatbelt and members want to install a 2500 km drainage system to arrest salinity and reclaim land that has become unproductive.

A similar drainage system has already been adopted on a small scale. The Yarra Yarra regional drainage program covers 100 km of drains between Kalannie and Morawa. Max Hudson, who established and is chairman of the Wheatbelt Catchment Alliance, says it is successfully lowering the water table and shows drainage can work. “We have seen the land improving, even in really tired areas. We have done all the homework. We have got it all mapped out, the plans are there, the business case is there. But no one will pick it up,” Hudson, told *Counter Magazine*.

*We’ve been bandied from pillar to post by government agencies and by successive governments. Our proposal for drainage is very sound. It’s backed up with science but it’s a continuous battle. They don’t think the science is right because it’s not peer reviewed. In their view, we’re just a bunch of farmers.*

The Auditor General’s report echoes that frustration, making the point that the Soil and Land Conservation Council, the key independent advisor to government, has not met since 2003. “In the absence of strategic direction, agencies have focused on protecting individual assets and there has been little co-ordination of efforts between agencies, landholders and stakeholders.”<sup>29</sup>

## GROWING PAINS

There is another pressure on available farmland and it has nothing to do with agricultural practices. The population is growing and people need somewhere to live. Approximately 70% of humans are expected to live in urban areas by 2050, putting an enormous amount of pressure on cities to expand. That expansion is often into agricultural lands. The movement of plant and animal foods from rural areas to cities will also increase and unless we can figure out ways for those nutrients to be used within our urban ecosystems, they will present further problems as city environments become sinks for energy and essential elements.<sup>30</sup>

In Sydney, on the fertile east coast of Australia, over the last few decades we have seen urbanisation become a big problem for peri-urban food production. Peri-urban areas have become increasingly urbanised and agricultural lands covered with impermeable surfaces.

Sydney Food Futures, a collaborative research project run through the Institute of Sustainable Futures at the University of Technology Sydney, says that “Sydney stands to lose 90% of its locally-produced vegetables if planned development goes ahead, with more than 50% of existing market gardens and poultry farms located in the designated growth areas under the Plan for Growing Sydney”.<sup>31</sup>

The NSW state development plan aims to accommodate projections that Sydney is expected to reach 6.2 million by 2051. Currently the peri-urban area around Sydney still produces about 50% of the state’s perishable vegetables. Soil in the cities not only serves as a potential for food production but also offers all sorts

of other ecosystem services – biodiversity, green infrastructure, water cycle regulation, control of air quality and mitigation of local climate (heat island effect).

## MINING FERTILE LANDS, WHAT THE FRACK?

Coal and gas mining and exploration is another threat to farming land. Mining the food bowl has become one of the most contested issues of the 21<sup>st</sup> century. Much of the land affected by coal seam gas in Australia is agricultural land.<sup>32</sup> Thanks to the Doctrine of Tenure, the Crown reserves rights over privately owned land, entitling it to claim ownership of the minerals and petroleum that lie on and under it. This right, known as a Crown reservation, does not take into account whether the land is part of Australia’s declining arable land.

In NSW, for example, gas companies are granted State government licenses and negotiate access agreements with landholders. Those access agreements provide compensation for any disruption to and impact on the property. But they do little to directly attribute a value to, or preserve, the land’s productivity. A fact sheet by Dairy Australia puts it plainly for members: “Ultimately, landowners have no legal right to refuse the gas company access to their land.”<sup>33</sup> In protest, farmers formed the Lock the Gate Alliance to prevent miners coming onto their land.

## MINING VS AGRICULTURE IN THE LIVERPOOL PLAINS

Producers on the Liverpool Plains know this situation all too well. The Plains are an extensive agricultural area covering about 12,000 km<sup>2</sup> of the north-western slopes of New South Wales. These are some of the most productive agricultural lands in the country, which can produce crops that yield about 40% above the national average of food per hectare, contributing to approximately \$332 million to GDP annually.<sup>34</sup>

The Lock the Gate Alliance says “all of this is now at risk from big coal and gas mining who are expanding aggressively across the region.”<sup>35</sup> Attempts to save the Liverpool Plains resulted in a bitter political fight and a crowdfunded public awareness campaign that reached across the city-regions divide by spelling out the problem like this: “Your food supply, your future, your problem too.”<sup>36</sup>

The NSW government ultimately acknowledged that mining the food bowl, in at least one area, was not viable and decided to buy back the Carroona coal mining exploration license from BHP Billiton. Then Premier Mike Baird said: “This decision guarantees the future of the State’s most productive and fertile farming land, providing confidence for local farmers to invest in an industry that has the potential to be one of the food bowls of the world.”

Producers had made their case: “you can’t eat coal”. It was a close call and just one of many battles. The State government also went some way to appease farmers when they reclaimed 51.4 % of the Chinese-owned company’s exploration license for the controversial Shenhua Watermark coal mine at Breeza. Buying back the farm cost tax payers \$262 million. But the company has also subsequently been issued an extension of its exploration licence. It includes a cancellation clause allowing the Government to terminate the project on June 30, 2020 if Shenhua fails to bring the project to production stage. Producers





in the Liverpool Plains have already been fighting the mine for a decade.<sup>37</sup> Despite then-Premier Baird's assurances the future of the State's most productive and fertile farming land is far from "guaranteed".

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Looking back over 200 years of evolving conventional agriculture and over 70,000 years of Aboriginal agriculture and land management, do we know enough to meet the 2050 goals?

Well, yes and no. This is the conclusion of the Government's 2014 white paper "Securing Australia's Soil: for profitable industries and healthy landscapes".

*Although Australia continues to produce world class soil RD&E [Research, Development and Extension], the full suite of knowledge and information needed to meet these challenges and to assess progress is not currently available. Australia needs a coordinated national soil RD&E strategy.*

Perhaps the key word here is "coordinated". The white paper points out some troubling trends. With over 150 organisations involved there is a "major disconnect between soil knowledge in

the research arena and the awareness, skills and practices of land managers." Research is scattered across multiple organisations that don't tend to talk to one another and "no mechanism exists to access, exchange, collate and deliver information from RD&E organisations, industry sectors or regions." The result: knowledge is not made accessible for those that need it most.

It would also seem that knowledge and innovation that is coming from those who toil the soil, such as Max Hudson and Duane Norris, not just government R and D, is not reaching far enough either: a problem that the Soil for Life network aims to redress. But more worrisome is the problem that such knowledge and innovation seem to be falling on deaf ears.

Is the solution a national soil policy? As Norris laments, water is the key to good soil management. Major General Jeffery also stresses the importance of a national coordinated approach to link Australia's soil, water and vegetation management. He proposes these resources must be managed in an integrated ongoing way across the continent. In the report *Restore the Soil: Prosper the Nation*, he says: "Put simply, if we fail to manage any one of the three correctly, the other two will also fail."



Duane Norris demonstrating on farm 4 - Image: Tarwyn Park Training

So rather than focusing on soil, he wants to establish a better coordinated land management policy. To achieve this, he is calling for better focused scientific research that capitalises on the flow of information to and from land users to identify and close the gaps in our knowledge. He believes land management challenges, and the role farmers play, is so misunderstood that it should be taught in schools.

Australia's farmers are aging and there's a risk a collective wealth of knowledge – gathered over generations and still evolving – might not be passed on. Let's not make the same mistakes the colonists made during settlement, and that successive governments have been making ever since: ignoring Australia's first custodians of the land – Aboriginal and Torres Strait Islander people. It is imperative that we listen to what all these custodians of the land have to say at a time of drought and climate change. And it's also imperative that the Federal Government take stock of what we know about this formidable land and assist in a coordinated and meaningful implementation of this wealth of knowledge.

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**Gary Cox is a global affairs journalist with a personal interest in dirt.**

**Kate Johnston is a social researcher of environment and food and fascinated by dirt in all its meanings and manifestations.**

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**Heidi Axelsen and Hugo Moline, The Visitors:  
An exercise in Plant Agency (vest) 2018.  
Biodegradable plastic, soil, cotton, seeds.  
Images: Silversalt.**

# Baker's Dozen

*Bruce Pascoe*

How many bakers does it take to make a nuisance of themselves?

Well last summer we had three bakers, two food scientists, two photographers, three dogs and two besieged house owners.

To harvest kangaroo grass you need hot weather and someone who knows what they are doing. All we had was the hot weather.

We had been researching some of the old people's traditional food plants and we were revved up to tackle the kangaroo grass. The summer before we had hand harvested an area of grass at the local airport and had ground the seed into flour and baked a loaf of bread for Ben Shewry of Attica restaurant, Melbourne. He'd been a bit over excited because we'd been out fishing on my home stream, the great Jinoor (these days Genoa) River, we'd had a couple of beers and he'd caught his first fish. He'd loved the bread and ate many slices. Which we thought might have been for breakfast.

It reminded me of Charles Sturt's 'exploration' party in 1843. They were saved from starvation by 400 Aboriginal people in Sturt's Stony Desert who gave them water and fed them roast duck and cake: Sturt declared the cake was the lightest and sweetest he'd ever tasted. Now we know that Poms can't cook, so when they're dying of starvation they may be inclined to exaggerate the quality of any food they are given, but it still surprises me that in a country with 500 cooking shows in the media we still don't know the grass from which those people made the grain to make that light and sweet cake.

Maybe it's because we cannot afford to look at the agricultural economy of a people from whom we stole the land and justified that theft to our Christian selves by saying the Aboriginal occupants were a low species of life who knew nothing about growing their own food and therefore didn't really own the land.

Anyway, despite that small omission from our country's history for the last 230 years, a baker's dozen of us gathered last January to harvest kangaroo grass, thresh it and grind it into flour and bake a few loaves. The baking was the easy bit because everyone in the room knew how to make bread (although the blue heelers were a bit scratchy), but for the rest of it we were working off a modicum of traditional knowledge and a thousand aberrant suggestions, the more aberrant the emptier the bottles became.

But our bread was aromatic as all heaven, had a wonderful texture and rich deep flavour. One baker started talking about the wonderful crumb but we thought there was plenty left and kept eating.

We are sampling other grains, other harvesting methods and other milling techniques but the certainty is that the grains Aboriginal people domesticated 30-40,000 years ago will become sensations in Australian and international cuisines.

We just have to get over the refusal to acknowledge how we came by the land, because you can't eat our food if you can't swallow our history.

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**Bruce Pascoe is a Yuin, Bunurong and Tasmanian man whose 2014 book, *Dark Emu, Black Seeds* won the NSW Premier's Book of the Year in 2016 and has been reprinted thirteen times.**





# Microbial Ecology and the Real Backbone of Terroir

*Lucien Alperstein*

Syrah and Shiraz are different names for a genetically identical grape. But double-parked on a wet spring afternoon in Enmore with a French Syrah in one glass and a Victorian Shiraz in the other, the difference between them is stark. The French is peppery, lean and tannic. The Victorian is velvety rich and bursting with fruit and spice.

Good wine is often said to reflect terroir, a slippery term that encompasses how the soil, climate and geography of a vineyard, the crop, the farming and winemaking practices all affect the taste of the wine.

A good wine should have characteristics that reflect the unique character of a place, as well as the practices of the people working in that place to make the wine. Some have debated whether terroir is real, arguing that if you can't define and quantify its parameters (acidity, mouthfeel, specific flavour and aroma compounds) then you can't confirm that it exists. This is akin to saying that yawning doesn't exist because we don't know exactly why we yawn, or how it's contagious. Perhaps one day we will be able to categorically define terroir, but for now, we can say that it exists, but is too complex to fully unravel.

Up until now, winemakers, scientists and wine drinkers have missed the most critical component that irrefutably ties terroir to wine – microorganisms. Typically, discussions about terroir centre on climate, geography and decisions about grape handling made by the winemaker. While these are contributing factors, the most significant differentiating factor among regional wines, and the least understood, is the microorganisms unique to a region. Microorganisms – yeasts, fungi, and bacteria and viruses – are solely responsible for the conversion of the sugars in grapes to the alcohol in wine. As well as this vital process, microorganisms are responsible for the conversion and creation of thousands of aroma, flavour and texture molecules found in wine. It's these microorganisms, specifically those that end up in the fermenting wine, that are responsible for many of the differences amongst wines made from the same grapes.

Microbiology, the study of living things too small to see with the

naked eye, is in a gold-rush era right now, with ground-breaking new work spanning gut health, environmental waste remediation and agriculture. To understand why microbes have been sidelined for so long, we have to delve into the history of microbiology.

Since the late 1800s, scientists have grown yeasts, fungi and bacteria from the environment on sterile nutrient-rich agar jelly in petri dishes. Every corner of the earth is teeming with microorganisms.

If you put a drop of must (crushed grapes), seawater, a speck of soil or a flick of saliva under a microscope you can see countless microbes – a whole world on a different order of magnitude. But for the last two hundred years, when scientists try to cultivate the microbes from those samples, a vastly smaller diversity of life grows on the petri dish, or 'plate', than what you can see under the microscope. In other words, if a scientist could count 10,000 different types of microbes in a sample under a microscope, only 200 would grow. Why were so many of them not growing under lab conditions? This difference in what can be seen versus what can be grown has been dubbed the Great Plate Count Anomaly, and remained a mystery for over two hundred years.

It's only in the last ten years that new technology has enabled oenologists (wine scientists) to really unpick the Great Plate Count Anomaly as it relates to wine and terroir.

Most microorganisms are incredibly niche and require a very particular set of conditions to live. They will die if there is too much food, too little, not enough water, too much. Most won't survive on their own because they have an incomplete digestive system and require other microbes to fully process nutrients – they can only survive as part of a more complex environment. For example, Rhizobia live amongst plant roots, bringing in nitrogen from the air and providing it to the plant in the form of ammonia (also the basis for chemically produced fertilisers), in exchange for carbohydrates produced by the plants. These symbioses are prevalent in most plants, and in grapevines they influence vine growth, health, pest resistance and fruit development. So when you put a drop of grape must on a layer of sterile agar, most of



what is alive in the must dies because it has been removed from its highly specific environment. What end up surviving are the microbial weeds – those bacteria, yeasts and fungi akin to the weeds that pop up between the bricks in a courtyard that get pressure hosed every weekend and just keep popping back up.

Luckily for us, it's primarily those "weed" yeasts and bacteria that perform the work in fermented foods. *Saccharomyces* yeast in bread, beer and wine, *Lactobacilli* in most cheese and dairy fermentation as well as malolactic fermentation in wine that gives chardonnays their classic buttery flavour, *Aspergillus* fungus in the majority of Chinese, Japanese and other Asian fermented rice and soybean products like soy sauce, miso, sake and Xiaoxing rice wine. The microbial weeds, yeast included, will dominate a fermentation given the chance. It's because of these easy-to-grow microorganisms that we have been able to produce – whether deliberately or by accident – fermented goods for as long as there has been surplus food, but it's also meant that the smaller players, those responsible for distinct local flavours and subtle differences between regions, have been overshadowed.

A new field, microbial ecology, describes the complete set of microorganisms and their interactions within a given environment. This is promising, because it may help to deepen our understanding of the relationship between microorganisms and terroir. Rather than trying to grow each microbe you see under a microscope, new technologies invented for human genetic research and co-opted by microbiologists allow scientists to perform a microbial headcount. Within a day you can have a list of every microorganism in your grape must, your saliva, your washed-rind cheese. The technology works because every living thing has a unique stretch of DNA. A DNA barcode. To see what's growing in a drop of grape must, for example, first you take a very small sample and break open the microbes in it using an extremely fine blender. The DNA leaks out of the broken cell, which is amplified and read automatically by computers in a lab. The DNA barcodes are matched up to known DNA sequences, and a list of both the microbes present in a sample and their relative abundance is created. This is how we know that there are a million times more microorganisms than we can grow out

of a gram of soil, and that in almost any given sample, whether seawater, apple juice or raw milk, the diversity present in nature is magnitudes higher than what we can cultivate in a lab. Today, the number of species of microorganisms estimated to exist on earth has skyrocketed to somewhere between one hundred billion and a trillion. The number we can grow successfully in the lab is roughly ten thousand, so around 0.00001%. To put that into numbers just so you can see the difference, we can grow 10,000 species of microorganisms, but there are somewhere around 100,000,000,000 different species. 10,000 vs 100,000,000,000.

Microbial ecology research tells us terroir comes from the thousands of lesser-known bacteria, yeasts and fungus found in region-specific wine fermentation. Information is limited, though, and even though we know wines made in different regions are different because of local microorganisms, we don't know just how these niche microbes interact with each other, exactly what role each of them plays in fermentation, and more broadly, how the microbial ecosystem functions as a single entity to produce a wine. If fermentation is a symphony, microbial ecology can tell us the name of every musician but not the instrument each plays, nor how the orchestra sounds with everyone playing together.

What we do know is that the way the grapevines are tended and the way a vineyard is farmed directly influences the balance of microbes living among the roots and on the leaves, vines and fruit. Pesticide use, weeding (or not), turning the soil (or not), burning pruned branches in the vineyard (or not), having animals in the vineyard (or not) all influence the microbial ecology of the grapevine, and therefore the microbes that end up performing the wine fermentation. And so, as well as climate, grape ripeness and winemaking techniques, farming practices directly influence the outcome of a wine by altering the balance of yeasts and bacteria that will perform the work of fermentation.

During the course of a wine ferment where no yeast is added (also called an uninoculated ferment – 'inoculation' being the technical term for adding microorganisms – and generally the defining step of "natural" or "minimal intervention" wine), thousands of species of yeasts, fungi and bacteria will be present when the

grapes are crushed. If sulphites are added, a large proportion of these microorganisms will die. If not, they'll create a vast number of acids, fats, esters and other flavour and aroma precursor molecules, including acetophenone (smells like cherry blossom and can react with acids in wine to form other aroma chemicals), octanoic acid (which reacts with alcohol to form ethyl octanoate, which gives some red wines a fruity, faintly fatty, pleasantly musty smell) and methylbenzoate (smells like feijoa). Various yeasts, primarily *Saccharomyces cerevisiae*, will begin to dominate the fermentation once alcohol levels reach 2-5% alcohol. From there, the diversity of microorganisms in the wine drops greatly, but those precursor molecules provide the remaining yeasts with enough material to produce a geographically unique wine.

Making wine using the microbes present in your vineyard doesn't guarantee a unique, complex or even pleasant-tasting wine but there is a very strong association between complexity in flavour and aroma and uninoculated fermentation. A winemaker's grape handling, combined with the particular weather conditions of a particular year, might result in a delicious, complex wine for that season. In another year, the same handling with different weather might favour microbes that produce lots of vinegar, or a strong Band-aid plastic flavour (a product of 4-ethylphenol and 4-ethylguaiacol molecules, which in low quantities at the right ratio contribute delicate leathery notes, but Band-aid when over the top). This means that "natural" or "minimal intervention" wines are largely being made in the vineyard, not just in the winery. The disconnect between many winemakers and grape growers who sell grapes to winemakers means that many critical factors that will influence the outcome of the wine will have already occurred prior to the winemakers receiving the grapes.

During a particularly difficult 2017 season in central Italy, a friend and winemaker who works biodynamically to grow a small plot of grapes and makes sulphite-free wines of incredible depth was questioning the hard-line mindset of natural winemakers, herself included. The Lazio region had had extreme heat and no rain for months, followed immediately by hail as harvest approached. She said that her winemaking was meant to be a celebration of the land, of respect for it. She asked me if, in a difficult year, the difference between pouring 10,000 litres of wine down the drain or saving it involved a small chemical addition or inoculation with particular bacteria or yeast to save the wine, wouldn't this be a more sustainable practice?

While this might be controversial in the natural/minimal intervention wine world, guided natural fermentation based on a better understanding of the microbial ecology of wine might allow winemakers to straddle the border between natural winemaking and a more considered, scientific approach where very small changes could be made to ensure a complete ferment, or to stop the onset of some serious vinegar settling in. It's an idea that I haven't quite reconciled but one that puts winemaking on a spectrum, rather than into black and white categories. On the one end are industrial winemakers, using multimillion litre tanks, mechanically harvested grapes, adding oak powder, yeast, egg shell protein, heat-treatments and more sulphur than Rotorua, and on the other end winemakers producing wine from grape-growing to bottling without any additions at all.

For people without access to land, or without the skill or equipment to make wine at either of these ends, there are various points along the spectrum of winemaking where they can fit

in. It's likely that in the very near future we'll be able to lightly manipulate the balance of microbes in grape must to produce a wine with a more predictable character, or selectively get rid of some microbes we know will definitely contribute a taste that the winemaker doesn't want in their wine, adding another, more hands-off but more predictable notch in the spectrum of winemaking techniques. Completely changing the microbial profile of a vineyard, however, requires much deeper knowledge of how the tens of thousands of microorganisms in a vineyard interact than we have today.

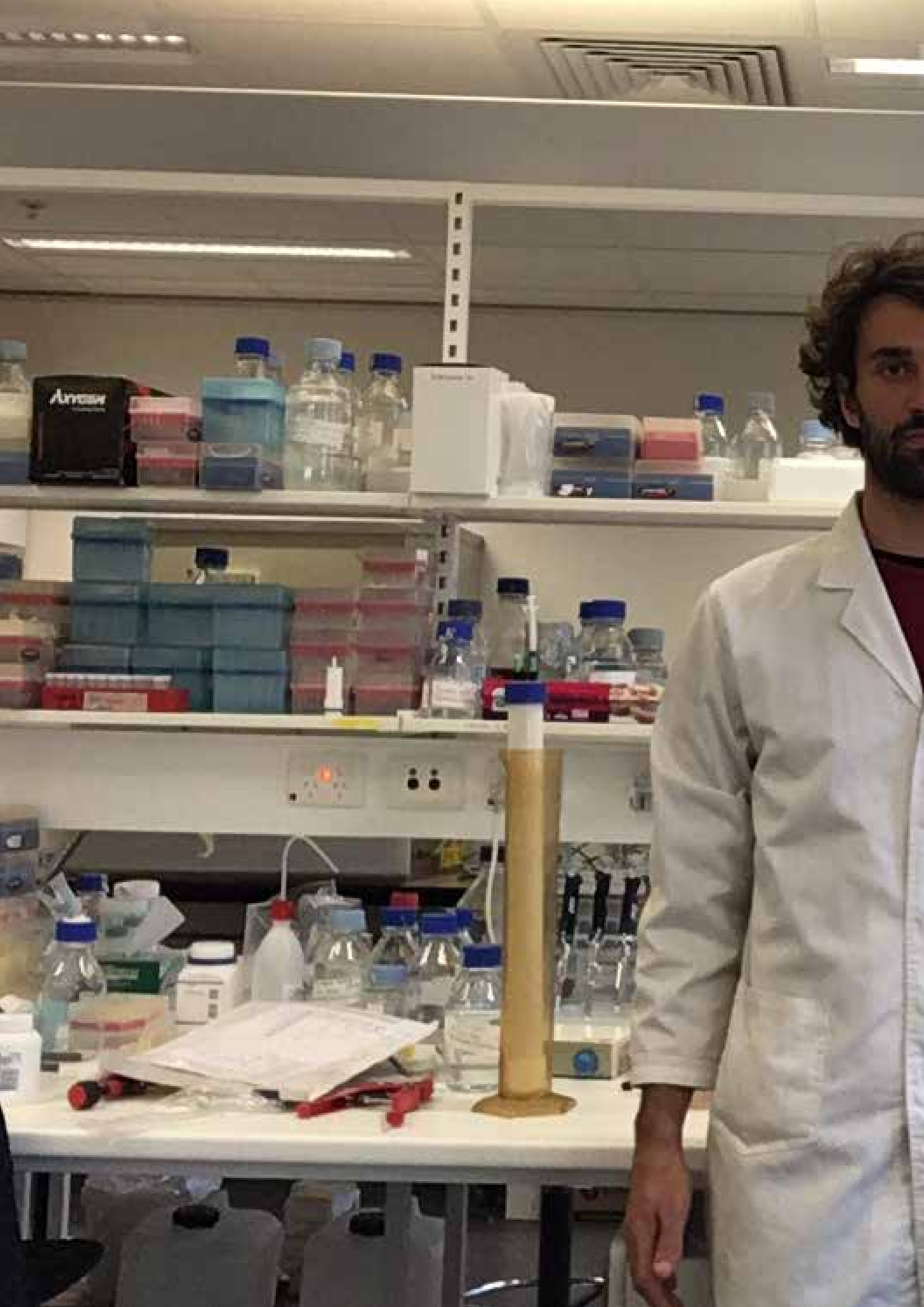
The peppery, earthy notes in the Syrah in front of me are likely the result of microbes capable of producing rotundone, one of the key molecules found in white pepper, and earthiness potentially from geosmin, a molecule produced by bacteria (also produced in soil immediately after rain, giving that characteristic petrichor smell). The velvety, rich texture of the Shiraz is likely due to higher glycerol production, which gives a thickening and smoothing effect, and the fruitiness bursting out of the glass a combination of esters, ketones and thiol-ketones (such as 4-thio-4-methylpentan-2-one, the main aroma found in blackcurrants). Both are distinct because of the microbes that made them.

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**Lucien Alperstein**



# Dirt Cheap?

*Tina Davis*

The mangoes, avocados and mandarins that grow in Australian soil and add colour to our plates share one thing in common with most of the people who pick them: they are migrants who have ended up on Australian farms through various routes. While we enjoy the great variety and tastes of the fresh food we buy in supermarkets, most of us know little about the people who are securing our harvest.

Djuro (27) from Denmark is a young man who entered the working holiday maker program and became a backpacker, because he wanted to travel around and enjoy all the good things that Australia has to offer. He decided soon after his arrival that he wanted to stay for a 2nd year in the country, so he started looking for farm work online to complete the 88-day of work requirement needed to apply for the extended visa. Djuro is well-travelled, confident and articulate. What attracted him to Australia was the beauty of the country, and that it is English speaking. For him it was a chance to be “home away from home”. His experience, however, never created a feeling of “home”. Djuro managed to complete the 88 days needed to get a second-year visa, but it took him 7 months altogether and by the end of it he was in debt. “The work circumstances were shit. I have never seen anything like it. It was like being in an under-developed country the way they treat you and the way they talk to you”, Djuro says. Although he can now stay on for another year in Australia, his experience has made him want to go home. Djuro tells of frequent incidences of discrimination and abuse. He says “the amount of shit we had to endure to get that second year [visa] was unacceptable. It was just inhumane”.

Food is big business in Australia. Our two largest supermarket chains, Woolworths and Coles, control over 70 per cent of the home market. Australians spend more than \$90 billion a year in supermarkets, and around \$60 billion of these are spent at the tills of the two major food retailers. In 2017, Coles’s parent company, Wesfarmers, was Australia’s largest public company, and Woolworths Ltd. came second. The market concentration has created a duopoly system where the big supermarkets have unprecedented buying power.

Woolworths and Coles’s unmatched buying power within the domestic food market allows them to set the terms under which the fresh food supply chain operates. The two major supermarkets count for 60 per cent of the total fresh food market in Australia. Growers depend strongly upon the big two for contracts. There



are around 30 000 mostly small- to medium-size businesses competing, which gives the supermarkets significant influence over prices. In 2013, the prices in Woolworths supermarkets were on average 11 per cent lower than in 2010. As a consumer, you may see this as a welcoming fact. However, it cannot be viewed separately from the price wars between the two food retailers, which have been a common feature in the domestic food market, nor can it be viewed separately from the effect this has had on other parts of the supply chain. The price war creates pressure down the supply chain, and the growers and workers are the ones likely to carry the burden.

Growers might have experienced pressure to reduce their production cost as a consequence of the price wars, which is said to undermine the suppliers' profit margins. They have little manoeuvring room to tackle the price pressure, and end up in a financial squeeze as a result. The growers get less return for the fresh food products they sell on, yet their costs for fertilisers, seeds, petrol and other necessities are externally fixed and therefore remain the same. The only flexible cost is the cost of labour.

The workers who get their hands dirty picking and packing on Australian farms are mostly temporary migrants. They come on visas that lead to different migration trajectories. The largest group of migrants in the horticulture sector is working holiday makers (backpackers). The number of participants in this visa program that were granted a visa in the year 2015-16 was 195,673 persons. Other migrants in horticulture are seasonal workers from the Pacific Islands, who can stay for six to nine months on the Seasonal Workers Programme. There were 6,166 persons on this visa in the year 2016-17. The Seasonal Workers Programme visa is more regulated than the working holiday maker visa, with stricter requirements to ensure better protection for the workers. Yet, this hasn't stopped exploitation from occurring. Other workers in this space are international students, and irregular migrants (undocumented migrants) who may have overstayed their tourist visa or are breaching a working condition of their visa. It is not fully known to what extent undocumented migrants are hired on farms, but according to the National Union of Workers (NUW) there are up to 60,000 undocumented workers doing farm work around the country.

What the diverse groups of temporary migrants share in common is the need to work. Some work to pay for their stay in Australia, while others come to earn money that they send home. Many come with the hope of getting a permanent visa to stay on in the country. By seeking work in the horticulture sector, they enter a space where some of the most precarious and insecure forms of employment are concentrated.

The horticulture sector offers low-paid, casual, and seasonal work. As a sector, it struggles to attract locals to perform the jobs needed due to the working conditions and level of pay. Performing a job out in the fields in high heat, doing physically challenging work, and having to stay in remote parts of the country while working under intense production pressure is not, it seems, an attractive path for the average young Australian. These days locals are difficult to attract and retain in this sector. Young locals would rather go for more consistent employment in less remote areas than the low-status work in horticulture, which mostly comes with no certainty. This is why growers are relying heavily on temporary migrants, who have become an essential source of on-farm labour in regional Australia.

Whether there is a genuine labour shortage of local workers or whether it's due to the poor wages and conditions in the industry is an ongoing debate. The large supply of temporary migrant workers in this space does not incentivise an improvement of conditions. A 2017 study (Sustainable Solutions: The Future of Labour Supply in the Australian Vegetable Industry) highlights that 78 percent of growers used temporary migrants in the last five years. Of this group, the majority were backpackers. In recent years, media coverage and research has revealed that labour law violations and exploitation is a regular feature of the horticulture sector. Stories of excessive work hours, underpay or no pay, debt bondage, discrimination, threats, physical and sexual abuse, retention of identity papers, and restriction of movement have become common.

Among regular temporary migrants in Australia, studies have found that backpackers are the group most vulnerable to exploitation. And within this group, the cohort of Asian working holiday makers<sup>1</sup> is the most vulnerable of all. The working holiday maker program is designed to be a cultural exchange program for young people that gives them an opportunity to travel and earn some money to sustain their stay along the way. It was introduced in 1975, and Australia's first working holiday maker agreements were with the UK, Canada and Republic of Ireland – all English-speaking countries with relatively similar economic standards and cultures. This started changing from 1980 when Japan was introduced to the program, followed by South Korea and Malta. In 2014, the program was extended to include 31 countries around the world, and today the program has 39 partner nations whose citizens are able to access the working holiday maker programs. The number of participants in the program has dramatically expanded from 1,855 backpackers visiting Australia in the year 1975-76 to 239,592 participating in the program in the year 2013-2014.

The high presence of backpackers can be linked to a policy the Australian Government introduced in 2005, which allows working holiday makers to extend their stay in Australia for a second year. The criteria for the second-year visa is to undertake 88 days of work in regional Australia within the first year of stay. An important detail to mention is that the work does not have to be 88 consecutive days with one employer, but 88 days altogether. Therefore, Djuro and many like him spend up to seven months travelling around the remote countryside in search for work to complete their 88 days. The employer is the one who has authority to sign off on the form that the Department of Immigration and Border Protection requires to process the application for a second-year visa. This leaves the young migrant workers vulnerable. Although the intention for the backpacker visa is still one of cultural exchange, the second-year option was an initiative from the Government to address labour shortage in regional areas, particularly in horticulture. However, this policy comes with trappings that render young backpackers susceptible to exploitation.

What makes this group as a whole more vulnerable to exploitation is a combination of factors, such as age, lack of work experience, limited knowledge about their work rights in Australia, cultural background and language barriers, lack of knowledge about protection mechanisms, and fear of speaking out to authorities. Technology also plays a part in that backpackers find work through adverts on Gumtree, Facebook and other similar online pages. The conditions that exist in the horticulture sector

combined with these factors create a high level of precariousness for backpackers. Asian working holiday makers experience the highest level of precariousness.

There has been a shift in horticulture from direct employment to the use of labour contractors since the late 2000s. Due to the increased production and price pressure that growers have faced combined with the unpredictability of the harvest, it is more convenient for many growers to hire workforce as and when needed. The managerial responsibility of ensuring compliance with labour laws has also largely been outsourced in the process. Growers often pay the labour contractor an agreed sum for the whole job. Sometimes the payment meets the exact hourly rate in accordance with the Horticulture Award, from which the labour contractors then will deduct their percentage and other costs. It is in this deduction process that wage theft happens. Other times the migrant workers are paid based on the piece rate system (a pay rate based on the amount picked or packed), which in Australia doesn't have a minimum floor, although it's intended not to drop below the minimum hourly wage. The piece rate system is often used by labour contractors and employers, and becomes an entry point into exploitation in the form of underpay, excessive work hours, and abuse. As such, it is a system in need of reform.

Labour contractors operate in some states in Australia without a license. Queensland, South Australia and Victoria have recently introduced labour licensing programs as a response to the many stories that have surfaced through reports and inquiries about indecent and exploitative conditions in horticulture. Although the programs are not identical, they have substantial similarities. However, there is a need for a national labour hire licensing scheme to effectively minimise exploitation of migrant workers and heighten the risk for perpetrators across states.

Although the regulation of labour contractors in horticulture is weak, labour hire operators are nevertheless obliged by law to comply with all Australian employment and occupational health and safety legislation on the same level as any employer who hires directly. Without a framework in place with resources to monitor the horticulture space this legislation has no effect. What has happened in this environment is that labour contractors have been able to trade in human beings with no more than an ABN number and a mobile phone.

A crucial dimension of precariousness that often shapes the experience of working holiday makers as they work along the harvest trail is their link to third party labour contractors. Private agents are known to be a key entry point into exploitation and forced labour both here and internationally. If a labour contractor is in the business of exploitation, then he/she may still operate in certain states without a licensing scheme at a low risk of getting caught. As such, it can be a high profit, low risk business model.

The cohort of backpackers most likely to work for labour contractors are Asian as they often face greater language and cultural barriers that may make it more challenging to find jobs. Deceit is a common feature in these employment relationships. A growing body of research is finding links between precarious employment and outsourcing internationally. What renders a situation precarious will depend on the workers' protection mechanisms in an industry. Not having a national labour hire licensing scheme in a low-paid, low-skilled, casual-based industry

where the work mostly takes place in remote areas will naturally exacerbate the precariousness of migrant workers. Especially when labour contractors are prevalent in this industry where trade union density is low and there is a need for a larger number of labour inspectors.

A young backpacker from Korea, Angela, who completed her 88 days in Queensland, tells a similar story to Djuro's. She was hired to work for a labour contractor who turned out to be the farmer's daughter-in-law. Angela was picking tomatoes. On her first day she worked for 13 hours straight, and it was so hot that she passed out from the sun. The labour contractor bullied the workers if they didn't work fast enough. At times when the tomatoes were not very ripe, she could earn as little as \$3 altogether for a 14-hour workday. On top of that, she was made to stay in a house provided by the labour contractor. She had to pay \$130 a week for a shared bedroom in a house filled with five others, a highly exaggerated price for the type of accommodation in a remote area she was pushed to rent.

Angela's wages would be put in envelopes and occasionally an envelope would simply go 'missing', but there was no chance she could get her money replaced. It took her more than a month after she left the job to finally get her last wages and the employer's signature for the days she had worked towards the 88-days visa requirement. Angela only got it after a local church minister helped her out by making persistent calls on her behalf until the employer finally paid her the money back. With the lack of labour inspectors and visible support from authorities, the churches ends up being the only support mechanism many migrant workers feel they can turn to.

The causes that create precariousness for temporary migrant workers in the horticulture sector, and which produce an environment where exploitation can thrive, include the seasonal and remote nature of the work, harsh working conditions, the prevalence of labour contractors in this sector, the lack of a national labour licensing scheme, weak monitoring and law enforcement, visa design, the piece rate system, low union density and as already mentioned, a lack of sufficient number of labour inspectors. These factors have led to exploitative practices, such as underpayment and no pay, tie-ins with employers linked to accommodation and transport, illegal wage deductions, extreme overwork, intimidation and threats, deception, debt bondage, recruitment fees for jobs, fees demanded by employers to sign off on the 88 day visa form, retention of identity papers, restriction of movement, and sexual assault. All these situations breed exploitation that can develop into more severe forms of forced labour practices. Research has shown that all of the International Labour Organization's eleven indicators for forced labour are present in the Australian fresh food supply chain. This means that consumers may buy fruit and vegetables in the supermarkets that have been picked and packed by migrant workers who are working in harmful and exploitative conditions.

Globally, there are an estimated 40 million people in modern forms of slavery today, and of these, 25 million are experiencing forced labour. Around 70% of forced labour occurs in the private sector, so corporate engagement is key to driving change. In 2015, the UK introduced the Modern Slavery Act 2015 (UK) with a transparency in supply chain reporting provision. Companies with a profit of above 36 million GBP are required to publish an annual statement where they set out what steps they have

taken to eradicate forced labour and human trafficking (modern slavery) from their supply chains. One of the criteria is that the statement has to be approved by the board and signed at CEO level. The idea is that a modern slavery reporting requirement will create a level playing field for business, as well as ensure a higher degree of transparency and accountability about risks and the measures taken to address modern slavery in domestic and global supply chains.

Last year, the Australian Government passed the Modern Slavery Act 2018 (Cth) that builds on the UK legislation to ensure greater corporate responsibility in tackling severe exploitation. The law applies to all Australian businesses and foreign businesses operating in Australia with an annual consolidated turnover of AUD \$100 million or more. The first modern slavery statements are likely to be due in 2020. It will be mandatory for companies to report on entity structure, operations and supply chain; modern slavery risks; actions taken to address those risks; and the business's assessment of the effectiveness of these actions. The Australian Government will also publish an annual consolidated statement covering Commonwealth procurement.

An estimated 3000 companies will have to report under the new law, and the Government will provide a central public repository for company statements, which can be scrutinised by civil society organisations, consumers and investors. New South Wales also passed the Modern Slavery Act 2018 (NSW), which is set to take effect in late 2019. The NSW Act broadly mirrors the Commonwealth Act, except that the threshold is AUD \$50 million and it provides financial penalties for entities that fail to publish a statement in accordance with its provisions.

The process to assess the need for modern slavery laws has also started in other countries, such as Hong Kong, Canada and Norway. One benefit of introducing similar legislation across jurisdictions is that it creates a harmonisation of laws, which makes the process easier for big companies who have to report in several countries. The chance of influencing the behavior of non-compliant suppliers down the supply chain will be greater when more large companies demand transparency and accountability from the same suppliers, and when big companies make modern slavery assessment a contractual demand.

These types of modern slavery legislations are an entry point to ensure that companies develop best practice around not only situations that amount to modern slavery, but all human rights violations they may risk being involved in. A law has the potential to create a race to the top for businesses which can take the necessary steps to change behavior and culture from within. Being exposed with slavery in your supply chain today can have a huge financial and reputational damage for businesses. Companies and the state will be assessed by what actions they take towards ensuring that modern slavery and other human rights issues do not feature in their operations or supply chains, not simply by the look of their report. With this type of legislation, organisations can move beyond compliance to create best practice that doesn't stop at assessing risks, but also motivates businesses to work long-term with their suppliers to improve and integrate human rights best practice into their procurement processes.

Although it is still relatively early days when it comes to measuring the impacts of the reporting requirement for the Modern Slavery Act 2015 (UK), the UK Government has been criticised for not

establishing a state-run repository for the annual modern slavery statements, and for not releasing a list with all businesses that are obliged to report, or including public procurement reporting requirements. Nevertheless, the Act has spurred conversations about modern slavery to top management levels and into boardrooms. There has been a significant increase in media reporting on the subject, and new partnerships and initiatives have been formed to tackle the problem. It has led to an increase in academic research, which is crucial to inform effective change. Investors are also demanding more disclosure from companies on issues related to modern slavery, which is a group that has significant influence over businesses and the way they handle risk, including human rights risk. An independent review of the Act has recently been completed that has put forward a set of recommendations to strengthen the Act.

Some of the big food retailers in the UK, such as Marks & Spencer and Tesco, have recently been named among the corporations that are leading the FTSE 100's<sup>2</sup> drive for better compliance with the Act among publicly listed organisations. And among the FTSE 100 companies that have reported under the Modern Slavery Act before April 2019, 87% have shown year-on-year improvement with their efforts. Another UK food retailer, Co-op, has established Bright Futures, an initiative that offers the opportunity for paid work placement and jobs to persons who have survived modern slavery. The aim is to help 300 survivors by 2020. Today there are 44 businesses and NGOs involved in the program working to achieve this goal.

In Australia, Coles and Woolworths supported the introduction of the Australian Modern Slavery Act, and they have escalated their activities around new ethical sourcing strategies, improving supplier training and tackling unlawful recruitment. The new Commonwealth legislation has the potential to shift business practices so that human rights become an integral part of company strategy for Australian companies. The law also provides an opportunity for the major supermarkets to show stronger leadership to drive out exploitation of migrant workers like Djuro, Angela and others from our food supply chains. Together with the necessary stakeholders, Woolworth, Coles and other supermarkets can now create a new paradigm where exploitation of vulnerable workers can be driven out of Australian farms.

*Note: The author has made every effort to be as current as possible in an area that is rapidly changing*

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<sup>(1)</sup> The author uses the term Asian working holiday makers because it is a term used in other most articles on this topic.

<sup>(2)</sup> FTSE 100 is the UK's Financial Times Stock Exchange, a share index of the 100 companies listed on the London Stock Exchange.



# Unearthed

## **2005: LAJIA, CHINA**

Remains of 4,000-year-old millet grass noodle found preserved in earthenware pot that was buried after earthquake.

*Source: BBC News.*

## **2009: COUNTY KILDARE, IRELAND**

3,000-year-old barrel of butter, known as “bog butter”, found in peat bog. Bog butter was often buried to increase shelf life or as an offering to the gods.

*Source: Science Alert.*

## **2017: MICHIGAN, USA**

Remains of an ice age mammoth point to human use of the mammoth carcass for food.

*Source: Minot Daily News*

## **2018: UZBEKISTAN AND KAZAKHSTAN**

Human bones exhumed from cemeteries across Central Asia reveal that nomadic pastoralists on the Silk Road had a diverse diet of wild and domesticated foods. In contrast, urban centres were like food deserts.

*Source: Science Daily.*

## **2018: EGYPT**

Cheese unearthed from Egyptian tomb in the ancient burial ground of Saqqara is at least 3,200 years old.

*Source: Science News.*

## **2019: CAMBRIDGESHIRE, BRITAIN**

Residues of cracked grain and starch molecules discovered on side of highway: evidence of earliest British beer-making.

*Source: Smithsonian Mag*









# Dirty Chicken: The story of an Unforgettable Meal in Rural China.

*Daniel Johnston*

Word and legend have it that a famous dish came about one day during the Han dynasty in the Jiangsu province of China when a beggar, in desperate need of a feed, stole a chicken. Now, the next part of the story changes from fable to fable, but essentially the beggar, attempting to hide his loot, covered the chicken in mud and placed it in a fire to cook, concealed and hopefully unnoticed. Coincidentally, the emperor came strolling around the corner and was taken aback by an unbearably delicious scent and demanded the recipe. Beggar's Chicken was born. Personally, I would have called it Peasant's Pheasant. Or Crook's Chook. Even Foul Fowl.

Zip forward a couple of thousand years and I was lucky enough to be invited to an annual family celebration and feast in a neighbouring province. I was working a stint in Hong Kong opening a new restaurant with a great crew. The manager of the restaurant, a local Hong Kongese, invited us along to the celebration at her uncle's weekend lake shack. It was to be a long lunch with the extended family, with us internationals as the special guests.

I am a chef, and as a chef, you don't turn down these opportunities. No matter how late you had to work the night before or how many doubles you've pulled that week you accept the invitation. We spend most of our days with our hands inside a dead bird's cavity, standing over a steaming stock pot or cutting vegetables into intricate shapes in an attempt to create a delicious meal for someone. To be invited into a family home, to experience raw tradition, custom and legitimate hospitality in a foreign country is a chef's wet dream.

We travelled out, hazy from the night before, first a train to Shenzhen, then onto a crowded bus down the highway, then into a mini van with someone who knew someone, along a bumpy rural back road and out to a tiny old village on the side of a vast lake. The village felt as if once upon a time it had been buzzing with a bustling fishing community, but now it was almost completely deserted. Where once there would have been a busy marina and vibrant market town, there were now rundown houses and workers' sheds, abandoned trawling boats eerily bobbing by old broken jetties piled high with tangled fishing nets. I didn't see another person at all that day, other than the family and company that we were with. How could we be so isolated and rural yet only an hour's drive from one of the most bustling cities in Canton?

We arrived at Uncle's place, set back from the lake, fringed by an old hilly quarry, and were greeted warmly by him and a few other family members. Uncle was small and lean, toned and well-suited to his cargo pants and crocs combo. He moved quickly

and always looked you in the eyes; his own often glistened with a spark of cheekiness, like that naughty kid from primary school.

There was very little English spoken by our hosts and even though I had been taking my weekly Cantonese class (sometimes), my strong points were merely numbers and basic greetings, all of which I used in the first 2 minutes of arriving, most likely with the wrong inflection.

Uncle's property felt dystopian, apocalyptic and other worldly – coincidentally, a favourite film genre of mine. Part military compound, part market garden and part Blair Witch, the property was more of a camp-out hideaway than a weekend lake retreat. I wondered if, like the rest of the area, it had also been abandoned a long time ago and Uncle had just claimed it as his own as somewhere he could go on weekends, strap a hunting knife to his thigh, and live out his boyhood adventure dreams. The set up was utilitarian and makeshift, a collection of simple buildings flat-roofed and dirt-floored, camouflaged tarps patching holes and missing walls and a half dozen old cars parked around the yard.

Nestled between the rambling vegetable garden, sugarcane patch, crow's nest tower and snake pit (yes, snake pit) was the simplest alfresco set-up of a large plastic table and a dozen or so chairs to match, the location for our festive lunch, under the shade of an exotic, fluorescent orange expandable gazebo and the soft hissing of tall, dark pines. A morning's travel yet a million miles from the Hong Kong metropolis that we knew so well.

The fishing shack kitchen, equipped with the most basic rickety bench, gas bottle and burner set-up was already bustling and lively with the sounds and smells of cooking. We spent the late morning trying to be of assistance in preparing the lunch but most of our time was spent just watching and exploring the intriguing compound in anticipation. I saw buckets of tiny live fish plucked and spiked, chewed on sugarcane stems and tried to spot the snakes. I noticed Uncle busy at the outdoor fire pit so we gathered to watch him prepare one of the centrepieces of the meal - the Beggars Chicken, a dish we had all heard about but never experienced. Uncle's version was a specialty of his and a closely kept secret recipe, which he wasn't about to share with some youngsters from the city; still, I watched and took mental notes. What I saw was a wet chicken, floppy and fresh from the kill, doused in a mystery brown sauce, wrapped in some leaves and placed in a bed of glowing coals, more coals shovelled to cover, then a wheelbarrow of landfill dumped on top till it resembled a sort of steaming, haphazard grave. Uncle gave a pleased smile, which we all understood as "bet you can't do that in your silly restaurants", and walked over to a different

barbeque to attend to another specialty. He was right, though I had once tricked out a restaurant combi oven to resemble an ancient Sardinian brick pit lined with laurel and wild fennel and a few smoking logs to roast a baby pig in.

We spent the rest of the afternoon eating. The meal was paced and there were breaks in between the dishes that just kept coming. We donned extra large plastic, disposable gloves and sucked the roe from hairy crabs, slurped sandy local clams and picked the meat off tiny fish. We experienced new flavours and textures, ate strange astringent fruits and floury, multi-coloured tubers and were encouraged to always have a full styrofoam cup of Jack Daniels.

Then finally our host announced, in strained English, flushed by the whisky, “the dirty chicken is ready”.

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It all made me think about opening my own restaurant one day, and how I'd want it to be. About what's important, why I do this for a living. I live in Sydney and I love restaurants and envy all my friends who have them, but I also hate them. Not my friends, the restaurants. Not my friends' restaurants, just the boundaries and limits of restaurants here, the boxes and formulas we end up following, the cool factor and restrictions. I'd like to have my own place, or one together with a bunch of friends, to throw parties, cook for friends, dance on tables and contribute to making our city an awesome and diverse place. I want people to feel excited and special. Is that a restaurant? And how would I make a meal exciting and memorable?

I've worked in restaurants as a chef for more than 10 years. I love the energy and buzz of a restaurant in the early evening, I love the creativity and fast pace and working really closely with fervent and caring people, I love the short term goals and immediate nature.

As chefs we tend to put food first. It is the medium and the conduit. It's our means of communication, of showing our beliefs, maintaining tradition, creating artworks, having fun, nourishing, gently inflating our egos and gold-plating our roles as glorified tradespeople.

It's easy to fall into the pattern of belief, that at the centre of a great meal must be the food, along with a designed room, feature light fitting and themed bar. Sydney is a city with a vibrant 'scene' and predictable restaurant models and formulas that nurture this approach. There are many wonderful people doing wonderful things, but we all know there can be so much more to a meal.

An extraordinary meal doesn't only revolve around great food but is as much about all the other things that hold it up. It is about storytelling and jokes, it is about adventure and excitement, purpose and reason, the friend you haven't seen in such a long time, the flush of comfort from the first sip of wine or the fact that you are holidaying in Puglia. It is about appreciating the old and enthusiasm for something new. It is about fun and music and dancing and snake pits, the memories of the night before and the eagerness for what's ahead.

I've had breathtaking meals in dingy eateries off grubby plates all by myself. I've eaten delicious food amongst people I hate and had a horrible time. And I've eaten bland and unthoughtful food in a magnificent dining hall and loved it.

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The chicken sucked.

It was chewy, tight and lacking in any real flavour. The flesh was flaccid, under seasoned and clung to the bones. Somehow, it was under cooked, over steamed and dried out all at the same time. I was ready for that depth and richness of slow-cooked meat, the warmth of smoke and of something wrapped in the dark and hugged by embers. I wanted to feel the rush of pleasure, fulfillment and achievement that that first beggar must have felt. I wanted to lose myself in the satisfaction of perfect, succulent meat, to become heady and dizzy with fragrance and drift off with the aromatic cloud of steam that rose from the parcel, and never come back.

But I didn't, and I didn't mind.

We kept the same plastic gloves on and attacked it with our hands, tearing with our teeth. The day merged into the evening as we kept picking at the mound of leftovers on the table and trying hard to tell stories to each other and break through the language barrier. Another bottle of Jack hit the table, the sun set through the eerie pines by the lake and Uncle, now well lubed, wrestled the snake.

No one really remembered the dishes, particularly the chicken, but it was one of the best meals of my life.

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**Daniel Johnston is a chef and restaurateur who is obsessed with spaghetti.**







# Dirt, Dung, Soil: Metabolic Intimacies

*Elspeth Probyn*

*It is the 2060's in eastern Colorado. More than half the world's population has been decimated from famine and America has been reduced to a struggling agrarian society for the past 30 years. ... In Earth's future, a global crop blight and second Dust Bowl are slowly rendering the planet uninhabitable.<sup>1</sup>*



As the above synopsis of the highly-regarded 2014 film *Interstellar* reminds us, famine and crop failure haunt the human imagination. Of course, this spectral figure does so in very different ways, and depends on different histories, geographical locations and political trajectories. It is spectral. It haunts us, and as a figure, it is more than mere image: crop failure of necessity brings together several registers. The finitude of soil is the finitude of human life as we know it.

Several years ago, when I lived in Adelaide, I often went outback during what was called the Millennium Drought (2001-2009) when the earth looked like it had been baked in a kiln. I learned from farmers that you never mention “the future” over dinner because no one could think ahead to times outside of the searing heat and fried land. Suicide rates soared. I realised with a shock of ignorance, having been raised in the wet of Wales, that South Australia really only has one river – the mighty Murray, now decimated from drought and political machinations over irrigation upstream. In Australia, of course, the “sunburnt land” is a phrase hardwired in schoolkids’ heads. In her famous poem of 1908, Dorothea Mackellar writes of her love for this “wide brown land” which is pitched against a vision of “the homeland”:

*the grey-blue distance,  
Brown streams and soft, dim skies*

The juxtaposition between burnt country and fertile lands is a constant theme in Australia that is physically felt in terms of water scarcity and food security, as the sunburnt land gets hotter and the driest inhabited continent gets drier.

To think of dirt and soil is to be mired in the past, present and future, where the future is drenched in dread. As María Puig de la Bellacasa writes about the USA, its “history of human-soil relations also can be read in terms of how they expose a combination of anxious restlessness about the future – in the face of disasters such as the dust bowl or fears of mass famine – with ambitious responses based on innovations that confirm the technoscientific productionist drive.”<sup>2</sup> Fear of famine propels wild scientific and political desires to “fix” nature, a chemical fix that is turning soil to barren dirt.

In this essay, I want to examine how the fears of famine, of land refusing to yield, have shaped our understanding of, and being with, soil. The term “metabolic intimacies” foregrounds the broad definition of metabolism as “the chemistry of staying alive – the process of matter and energy exchange that goes on

within a living organism to keep it from dying”<sup>3</sup>. It also brings into play how humans are intertwined with the life and the death of soil. This social and biological framing includes Karl Marx’s famous argument that capitalism disturbs “the metabolic interaction between man and the earth”. “All progress in capitalist agriculture”, says Marx, “is a progress in the art, not only of robbing the worker, but of robbing the soil.”<sup>4</sup>

Marx might have said that the ecological and social disaster of the 1930s Dust Bowl era in America was evidence of how capitalism robbed the earth and the worker. Right in the middle of the Great Depression, the near decade of Dust Bowl conditions was the result of a combination of bad economic planning, land speculation, climatic bad luck, ignorance, and poor land care practices. Changes to US federal Homestead Acts in the 1920s had resulted in large-scale immigration to the Great Plains of people with no experience of farming. As they hastily cleared the land, they removed the plantation – mainly wild grasses – that had held top soil in place since time immemorial. Clearing the land for crops became ever more frenzied when wheat prices rose in the interwar years. The clearances and plowing further eroded the top soil. When a series of droughts hit, winds carried formerly precious soil across thousands of kilometres from Texas to Nebraska, from Oklahoma to New York. In May 11, 1934, a massive dust storm two miles high carried dirt, dust and soil over 2,000 miles to the East Coast.

The devastation left huge tracts of land barren, and forced the migration of large numbers of people towards the west in hopes of food. The tragedy of what happens if you continue to rob the soil was documented by now-famous photographers, such as Dorothea Lange, who were directed by the government to depict to “city people what it’s like to live on the farm”<sup>5</sup>. Her photographs such as that of Florence Thompson with several of her children in a photograph known as “Migrant Mother” depict the hopelessness of people without soil, living on dirt. While they were to build urban sympathy for these poor people, these images would have also awakened a dread that America would slide back into an agrarian state – fears that *Interstellar* plays upon.

The widespread disaster of conventional farming produced some seemingly wacky counter-strategies, such as ‘trash farming’. This was the brainchild of Edward Faulkner, an iconoclastic American farmer, who in the *Plowman’s Folly* explained his ideas about how to reverse the damages caused by chemical pesticides and over-ploughing.<sup>6</sup> Faulkner’s conception of trash farming saw

soil as a living system of capillaries. When conventional ploughs are used the soil mass is violently broken apart disrupting the capillary connections through which water seeps. Faulkner's answer was taken from Asian farming practices. Eschewing the plow, he recommended disc-rotoring the crop residue, or trash, into the soil. The result was a 'trashy', surface soil scattered with debris and "teeming with organic matter."<sup>7</sup> Faulkner was hardly a Marxist: he predicted that "American farmers can undersell the rest of the world", and that farmers 'would become middle-class consumers . . . and the tensions of civilization will become more relaxed.'<sup>8</sup> Faulkner's plan was not so wacky. He was part of the Western forefathers of the organic movement, and his no-till system practiced what Sir Albert Howard called "the law of return". The respected soil scientist David Montgomery recently argued that "no-till farming can reverse [degrading soil organic matter through plowing] by stirring crop residues back into the soil surface."<sup>9</sup>

## HUMAN-SOIL INTIMACIES

As anyone who has peed on the bone-dry hot earth in the Australian Outback knows, there is a seemingly mutual pleasure when urine hits soil. Here I want to explore an ancient counter-strategy that Albert Howard and F.R. King (both early proponents of alternative agricultural practices) had independently observed in Asia, one that Americans and most of the West were and are too squeamish to take on. Here I sketch a story of how for millennia Chinese farmers used human excrement as fertiliser to instil a *more-than-human*<sup>10</sup> vitality to the soil; an historical arc that was brutally interrupted by a scientific and political experiment that resulted in the starvation and death of some millions of people.

In his book *The Good Muck: Toward an Excremental History of China*, Donald Worster cites an account of making manure from human excrement that dates back to between 386-534 CE. Certainly, this practice was widely accepted, and in the 19<sup>th</sup> century Victor Hugo celebrated how the Chinese cultivated their soil. In *Les*

*Misérables*, Hugo has long tracts about the necessity of using the excrement from what we eat to feed the soil that will provide our meals.

*Not a Chinese peasant . . . goes to town without bringing back with him, at the two extremities of his bamboo pole, two full buckets of what we designate as filth. Thanks to human dung, the earth in China is still as young as in the days of Abraham.*<sup>11</sup>

Hugo deplores the West's waste of human wastes: "What is done with this golden manure?", he asks. "It is swept into the abyss".<sup>12</sup> Golden excrement indeed. Worster recounts how over thousands of years Chinese "treated the human body wastes as a valuable commodity."<sup>13</sup> As Rose George writes,

*Of all the peoples of the world, the Chinese are probably the most at home with their excrement. They know its value. For 4,000 years, they have used raw human feces to fertilize fields. China's use of "night soil," as the Chinese rightly call a manure that is collected after dark, is probably the reason that its soils are still healthy after four millennia of intensive agriculture, while other great civilizations—the Maya, for one—floundered when their soils turned to dust.*<sup>14</sup>

This model of human-soil interaction necessitates bringing together several different registers. It requires a different conception of human to soil, and a different metabolic relationship between city and country.

Instead of seeing human excrement as foul, as that which pollutes, stinks, as unsanitary, as insalubrious and unhealthy, the practice of valuing human shit involves a different understanding of human-and non-human bodies: a mingling that brings about the "nurturing of a dynamic community of many kinds of beings all interacting for mutual survival."<sup>15</sup> It also recognises what's in human poop. Apparently, a tonne of human excrement would yield about five and a half kilograms of nitrogen, nearly one kilo of phosphorous, and 1.8 kilos of potassium. These chemicals (NPK) were named by the German scientist Justus Liebig in the

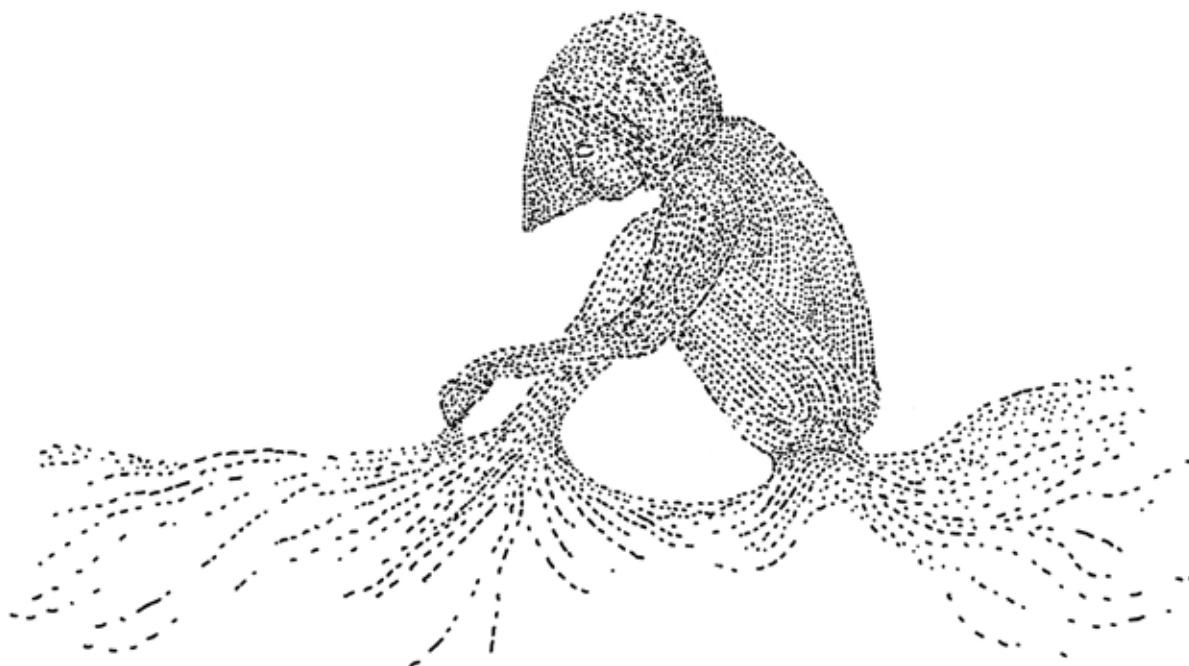


Image: Lucy Klippan

19<sup>th</sup> century as the three essential elements for soil fertility. In terms of scale, you need a lot of people's poop. But even back then, "the combined excreta of China's five hundred million people, each producing 40 ounces per day, was considerable."<sup>16</sup>

Just as this system produced a metabolic intimacy between humans and soil both participating in the rejuvenation of farming land ("the dynamic community of many kinds of beings all interacting for mutual survival" that Worster paraphrases from Charles Darwin), so too did it enact a metabolic interaction between urban and rural. As China's cities grew, they demanded more food, and their increased poop was needed for the soil. An ingenious system came about where the night soil on urban streets, now seen as a commodity, was gathered by middlemen (fenfu) and sold to farmers. Human wastes also became hierarchised with the excrement from the elite earning more because they were better fed, and of better health yielding better quality excrement. The industry became more organised, and workers would take the dung to fields where it was laid out to dry and to begin to compost thus getting rid of some of the harmful effects of putting raw shit directly on crops.

This system continued for centuries. It was not quite the romantic view Hugo had of happy pigtailed peasants wandering back from the city with bowls brimming with healthy human dung. The carriers were often unemployed men paid low wages, and the labour of lugging it back would have been considerable. Westerners visiting China continually reported on the poor technical state of agriculture, describing "the Chinese peasant as the twin brother to the ox", and writing in shock about the widespread use of human manure to fertilise the fields.<sup>17</sup> Nonetheless, it was a fairly balanced system that did yield healthy crops.

## THE GREAT FAMINE

This was all to drastically change under the rule of Mao Zedong. From the mid 1950s, Mao sought to develop industrial infrastructure in a predominately agricultural China, which was to come at the expense of farming, and ultimately of feeding the country. Y.Y. Kueh, a China specialist, describes the agricultural-industrial problem as "the problem of agriculture, the problem of peasants, and the problem of the rural."<sup>18</sup> Mao's plans to yoke agriculture to industry and to feed the large Chinese population were arguably the most ambitious attempt in history to fix these problems. They also resulted in the world's worst manmade famine.<sup>19</sup>

In 1955, Mao delivered his speech, "On the question of agricultural co-operatization", which threw the countryside into upheaval.<sup>20</sup> The scale of the problems that Mao faced not only in feeding China but also of securing the support of the vast peasant population is mind-boggling. As Mao is reported to have said to Edgar Snow, the American journalist and writer who was accepted by the Communists: "Whoever wins the peasants will win China. Whoever solves the land questions will win the peasants."<sup>21</sup>

Mao's policies focused on grain – "grain is the key link" – and collectivised agriculture. By 1956, 90 per cent of farmers had been forced into collective farms each made up of about 170 families, who would have previously had small subsistence holdings. Life was tough: it is estimated that 100 million peasants

lived on grain allocations, which yielded a scant 1,500 calories a day. The drive to produce steel had everyone scrambling for any metal to melt down in backyard furnaces. The amount of labour that people had to do on such a pittance of food is astonishing. But there was no way out for them. In 1956, internal migration was made illegal, so that people could no longer follow the age-old route of escaping drought areas for other parts of the country. Equally, all farm animals were collectivised.

It was to get worse. In 1958 Mao announced the Great Leap Forward, which one of his lieutenants Liu Shaoqi promised as: "Hard work for a few years, happiness for a thousand."<sup>22</sup> This reform increased the focus on grain and steel, with disastrous consequences. The rush to make scrap metal into steel caused huge de-forestation, and the sole goal of grain meant that crops better suited to differential agricultural conditions were uprooted in favour of a monoculture across the whole of the vast country.

In the euphoria of the Great Leap Forward agricultural policies took a decidedly strange turn. University-trained scientists were seen as suspect by the CCP. There was also a slavish emulation of all things Soviet until Krushnev and Mao fell out. For quite a time, the theories of the Soviet star scientist, Trofim Lysenko, reigned.

*Although it's impossible to say for sure, Trofim Lysenko probably killed more human beings than any individual scientist in history. ... But Lysenko, a Soviet biologist, condemned perhaps millions of people to starvation through bogus agricultural research—and did so without hesitation.*<sup>23</sup>

Lysenko was a 'barefoot scientist' who rejected Mendel's theories about plant genetics and created his own, called agrobiology. He had some spectacular experiments, which flopped with huge consequences. Nonetheless Mao took up many of his ideas and made sure they were strictly adhered to around the country. These included close planting, whereby seedlings were left unthinned and of course eventually crowded themselves to death. Another strange idea was that the deeper the plowing the better. This meant that peasants had to dig troughs several feet deep, which did nothing for them or for the poor buried seedlings. Lysenko did not believe in genetics (which he saw as fascist) and he instilled some farfetched ideas about plant and animal breeding – for instance the idea of crossing a tomato with cotton to produce red cotton.<sup>24</sup>

The common sense of the peasants might have saved the day from such craziness, however there was little room to escape the State. The local Party authorities routinely inflated the production levels to impress Mao and Beijing. In a cruel twist, totally fictional accounts of grain surpluses were issued in order to raise the status of the peasants. The reality was that there was nothing left over for the grain allocations. And because individual plots and kitchens had been collectivised there was nowhere to hide from the State's surveillance or anywhere to grow sustenance crops for families. As Yu Liu states, "peasants' dependence on local authority became almost total with no possibility of exit."<sup>25</sup>

From 1958-61 crops failed across the whole of the country. The Great Famine of China has been called the worst famine in the history of the world. The estimates of deaths from starvation vary between 15 million and 40 million, and it is now widely accepted that some 30 million died. The question of whether the



famine was man-made or natural continues to divide opinion. But only in the West. In China, there is still little said about the Great Famine. In 1982, an account by a Chinese studies academic entitled “Food, Famine, and the Chinese State” barely mentioned it and certainly not as “the Great Famine”. It was left to Western journalists to try to make sense of what had happened. Jasper Becker, the Beijing bureau chief for the Hong Kong-based *South China Morning Post*, wrote one of the first accounts. His 1998 book, *Hungry Ghosts: Mao's Secret Famine* makes for gripping and grotesque reading. “People ate cats, dogs, insects. Parents fed dying children their own blood mixed with hot water,” one survivor reported. “In the yellow-earth country of northwest China ... people abandoned their children by the roadside in holes dug out of the soft soil in the forlorn hope that some travellers would discover and take pity on these waifs.”<sup>26</sup> Cannibalism, apparently, became a widespread practice. Whether this is true or not, the scale of the tragedy is beyond our comprehension.

In 1978 Deng Xiaoping dismantled the communal farms. Deng's reforms have set China on a different course. In naming Deng as one of the top names in ‘60 years of Asian Heroes’, Time Magazine notes: “Mao might have pulled the nation together, but it was Deng who pushed it toward prosperity and modernity.”<sup>27</sup>

Prosperity arrived in China in a pretty rocky way. The great economic gains arising from Deng's economic reforms in 1982 squeezed the peasant farmers as urbanisation eats up more and more arable land. In 2000, for the first time since 1949 the amount of farming land dropped to below the warning level of 110 million hectares seen as necessary to feed China's 1.3 billion people.<sup>28</sup>

The end of the ancient arts of human-soil interdependence came in 1975, a year before Mao died, when the first of the Chinese factories producing chemical fertiliser opened. China now produces over half of the world's chemical fertiliser. Studies show that 80% of the nitrogen in Chinese bodies comes from food produced in China with chemical fertilisers.<sup>29</sup> There is no doubt that having ditched dung for chemicals, Chinese farmers are going all out: “The primary inefficiency is the amount of fertilizer that Chinese farmers use — more than twice as much as their U.S. counterparts. That fertilizer washes off the fields and pollutes waterways. It turns into nitrous oxide gas and warms the earth.”<sup>30</sup> The arrival of modernity in China also meant more toilets, and most importantly personal ones where the excrement can't be easily extracted.

#### “BLACK GOLD”<sup>31</sup>

However, the engrained metabolic intimacy of the Chinese people with feeding the soil using their own waste has now come back into its own and is being scaled up in a way that the Chinese do best. Some 40 million farm homes across China have a holding tank for human and animal waste, which is then turned into fertiliser as well as biofuels. In Beijing, 6,800 tons of human excrement is collected and treated each day.<sup>32</sup>

From his observations of the Chinese system of using human wastes as fertilizer, F. H King wrote in 1911: “The human waste must be disposed of. They return it to the soil. We turn it into the sea.”<sup>33</sup> Now more than ever, as the world's population continues to explode, and chemical fertilisers pour into warming seas thick with plastic and pollution, we need to stop our practices

of dumping our shit out to sea where we hope it cannot be seen or smelled. As I have explored here, the spectre of land failing us, of soil being just dirt, has haunted human imaginations and spurred on the hubris that science will magically protect us. In the Chinese case, thousands of years of human-soil intimacy were brutally interrupted by political desires and techno-scientific experiments.

The West's vast chemical empires churning out artificial fertilizer continues to participate in that hubris. We desperately need something that keeps us honest in our hopes for a better equilibrium in our metabolic intimacy with the soil that feeds us. Dung may be the key link. Seemingly inert yet teeming with such necessary energies, dung is the stuff of us all.

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**Elspeth Probyn is a professor at the University of Sydney. Her latest book is *Eating the Ocean* published in by Duke University Press.**

- <sup>1</sup><http://www.imdb.com/title/tt0816692/plotsummary>
- <sup>2</sup>Maria Puig de la Bellacasa, “Making time for Soil: Technoscientific Futurity and the Pace of Care,” *Social Studies of Science* 45, no. 5 (2015): 697.
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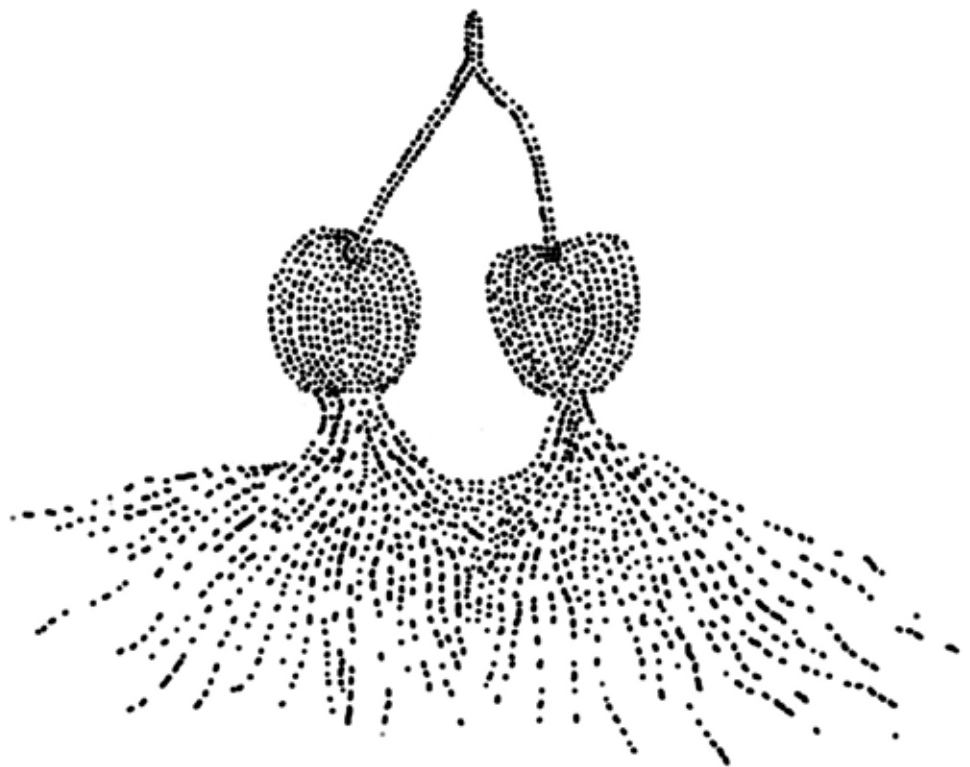














Image: Helix Games | Canva

# Brown:Green – A Recipe for Compost

*Melinda Johnston*

Most gardeners have had their share of compost success and failure: large heaps, small heaps, hot ones, cold ones, above ground, below ground, in bins, on garden beds. And just like cake recipes, compost recipes are based on good, old-fashioned science. Sweet, sour or smelly, fast or slow, compost heaps are all about the balance of carbon-rich material (often thought of as the brown stuff) to nitrogen-rich material (the green stuff). In order to thrive, the microorganisms that are going to do all the heavy lifting in the decomposition process need the correct proportion of carbon and nitrogen (C:N). So if you want those micro critters to work hard and produce a successful, sweet, rich compost, the science says that you will need a ratio of about 25 parts carbon to 1 part nitrogen, i.e. a C:N of 25:1.

“But wait a minute, that’s a lot of brown stuff and not much green stuff!” you might say. But here’s the clincher: all organic material contains both carbon and nitrogen. It’s just that the “green” stuff has more nitrogen than carbon, and the “brown” stuff has a whole lot more carbon than nitrogen. The C:N ratio is about the chemical composition of the materials, not the volume.

The clever scientists have worked all this out for us clever gardeners, and you can get your carbon/nitrogen ratio humming along by using a basic recipe of 2 parts green stuff to 1 part brown stuff for a hot, fast compost. Alternatively, for a slower, add-as-you-go compost, use 1 part green to 1 part brown.



# **RECIPE:** for the hot, fast, above ground, build-it-in-one-go method

## **Ingredients**

Diversity is the key – a variety of ingredients will help create that magic C:N ratio, attract many different microorganisms, and provide you with a richer and sweeter end product.

### **2 parts of the green stuff (nitrogen rich)**

- Soft green clippings from your garden, the smaller the better.
- Lawn clippings (a great way to get instant heat), beg, borrow or mow.
- Animal manure, preferably aged, such as horse, cow, chook, duck, worm castings. No dog, cat or manure from carnivorous animals.
- Seaweed from the beach.
- Comfrey leaves are a great compost activator and easy to grow.
- Kitchen scraps, no meat, not too much citrus or onion.
- Coffee grounds, cafes give it away.
- Weeds. If the weeds have seeds, the pile needs to really heat up to prevent them from germinating.

### **1 part of the brown stuff (carbon rich)**

- Straw/hay/lucerne/sugar cane mulch
- Shredded and wet newspaper/cardboard brown bags
- Brown (they're not dead) leaves and other brown plant material. Stockpile during autumn. Lemongrass, like comfrey is easy to grow and provides a great source of carbon rich material when slashed and left to dry on the ground for a few weeks.
- Sawdust
- Woody twigs (small)
- Nut shells, egg shells (broken down)

Water. A moist environment (not wet) is essential to keep the micro critters happy.

Air. Aeration is important for the microorganisms to thrive.







## The Method

1. Start on the ground. Ideally, your pile needs to be in contact with the earth. If you want a variety of microorganisms to come and work for you, they need to be able to get in from all directions.
2. Create a space. 1m x 1m x 1m (approximately) Unless you have a front-end loader in the garage, it is best to stick to a size that is more suited to a garden fork, and one that you can turn in a couple of yoga movements.
3. Build your structure. You can use a purchased compost bin or build your own using recycled \ materials such as leftover pallets from the hardware store. There are plenty of suggestions on how to construct on the internet. Alternatively, just build the pile on the ground.
4. Gather your green and brown stuff. When measuring your ingredients, keep in mind that a wheelbarrow of brown stuff is likely to be less compacted and contain more air than a wheelbarrow of green stuff.
5. Layer your materials. Damp down as you go, finishing with a layer of brown.
6. Cover. You can use hessian or an old blanket. What you are doing here is keeping as much of the heat, moisture and air in the pile as it \ warms up.
7. Wait for 3-4 days and let the magic start to work. The pile should become warm, even hot. If it doesn't, the C:N ratio may need adjusting so mix in some more green stuff - lawn clippings, comfrey or pelletised chook manure for an instant boost, making sure the pile is moist and aerated.
8. Turn the heap after a week. This will aerate the organic matter and enable the compost critters to do their work.
9. Keep the pile moist and aerated once a week. Either a compost aerating tool or garden fork are helpful here. The pile will cool down, reduce in size as it decomposes and be ready within 6-8 weeks.
10. Stand back and admire. Organic compost is the best food for your soil. Most gardeners will tell you that glorious gardens start with the soil. Look after your soil .... and your soil will look after your garden .... and your garden will look after you.

*Note: if the pile doesn't heat up, don't despair. It can become a slow add-as-you-go compost.*



# Dishing the Dirt on Osteria Francescana

*Nick Jordan*

I'm not one of those people who flies around Europe with a suitcase of cash and a checklist of expensive restaurants. Going to Osteria Francescana, the best restaurant in the world (according to The San Pellegrino World's 50 Best Restaurants list), was a big fucking deal for me. I'm not a sceptical person either, quite the opposite – if all my attributes were tallied like they do in video games, the only thing nearing a 10/10 would be my enthusiasm. Simply put, I didn't go into this experience with a loaded opinion, ready to shoot it down at the first misshapen petit four or unironed napkin. It was my birthday week, I was there with one of my best friends and I wanted to like it. I wanted to tell people I liked it and most of all I was ready to have a really good time.

But I didn't.

The first feeling of discomfort came before we even stepped into the restaurant. It was the front door. It's tall, grey and as closed and unwelcoming as the curtained windows next to it. If it wasn't for the gold-plated plaque we wouldn't have known it was a restaurant.

We opened the door. It was heavy, slow and revealed a forest of suited men so black and stern that I wondered if we had accidentally waltzed into an illegal gambling ring. They all looked at me and paused, waiting for me to make the next move. I felt out of place.

"I have a reservation for two under Nicholas Jordan."

"Right this way sir."

The suits, now holding their arms like plateless waiters, parted and watched as we were seated in a grey curtained room with two other tables. The decor was bare besides for some sad portraits of Edith Piaf and a minimalist painting on the far wall. Had I seen a picture of the room out of context I'd have guessed it was a CEO meet and greet space within the office of a successful financial firm.

What came next was a whirlwind of ideas, flavours and textures. One course was simply three kinds of house-baked bread including an unforgettable sourdough croissant. Another was a tempura crisp topped with preserved carp ice cream, a tasty concoction I found out later is a take on fish and chips. One idea, called 'eel swimming up the Po', combined a slice of eel, a puddle of grape juice syrup, flakes of vanilla ash and burnt onion powder. Later there were five different types of parmesan

each formed into a different texture, a paddle pop consisting of 50-year-old balsamic vinegar and foie gras, and a dessert named 'Oops! I dropped the lemon tart' - a lemon tart that had been artfully arranged to look as if it had been dropped.

Mostly it was delicious. The courses which weren't, were at least interesting because they didn't taste like anything I'd eaten before. But I didn't enjoy eating any of them. I don't think I would have enjoyed eating anything there. It was too serious, intimidatingly so. Despite my best efforts to joke and enjoy their company, the waiters spoke to me with the subservience of an indentured butler. 'Yes sir' 'No sir' 'Oh certainly sir'. The music didn't help. It wasn't quite lift composition, but definitely something you'd hear while you were on hold to an organisation that deals with tax. It was also extremely quiet. At most good restaurants you can hear people having a good time. Here there was just the odd clink of plates and the sound of our own voices. I'd spent the whole evening whispering.

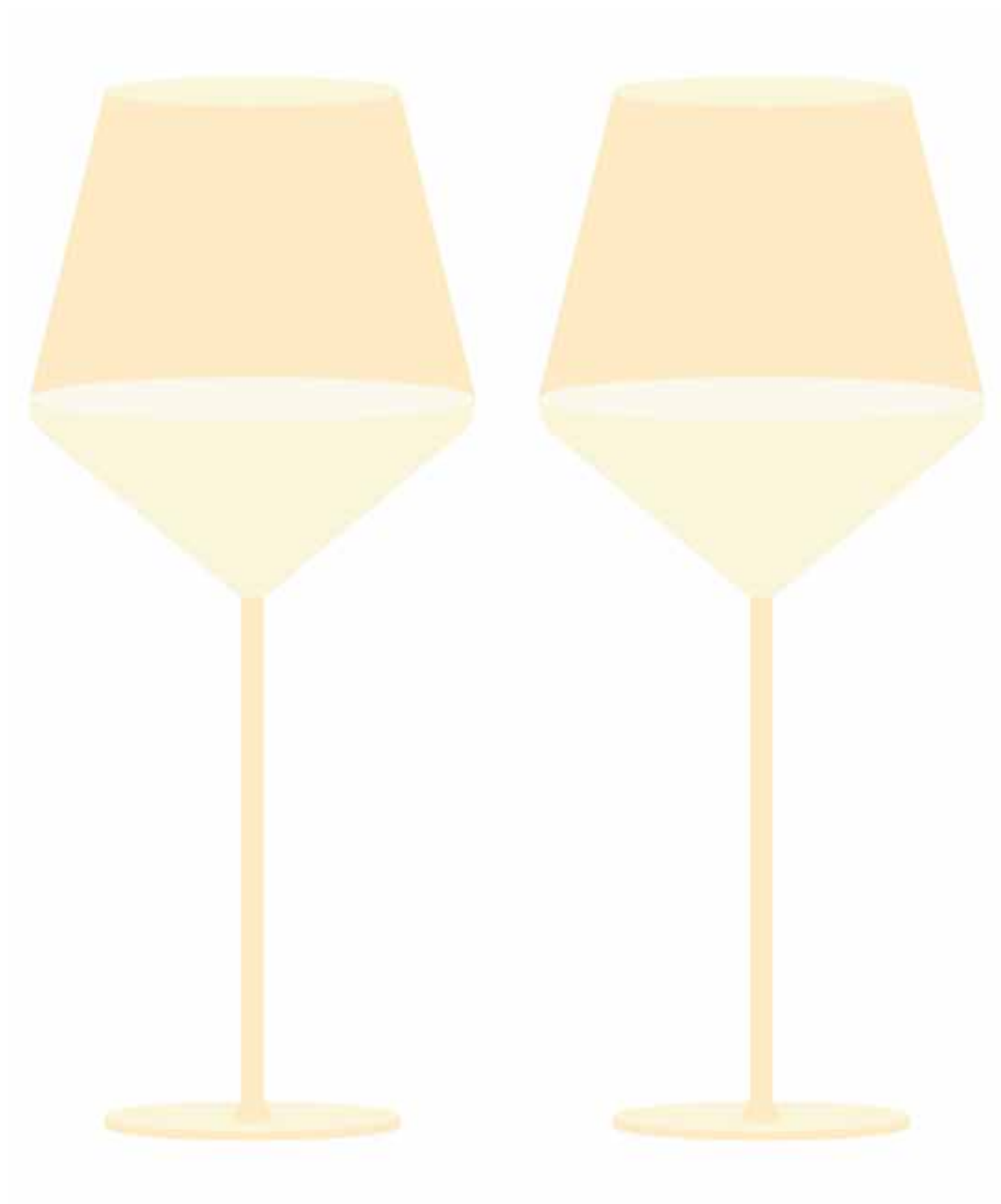
I thought back to a pistachio ice cream I'd eaten a day earlier in Bologna that was so enjoyable I became euphoric. It was like I was high. I yelled, I laughed, and I wanted to tell everyone how good it was and how I felt. I've had that feeling many times over my life, but I didn't feel that once at Osteria Francescana.

This wasn't the first time I'd had this experience. I've been lucky enough to eat at many fine dining restaurants in Australia and the US as a food critic and a regular customer, and although they weren't quite as atmospherically oppressive as the Osteria, most had a similar stitched-up, formal vibe.

It all sent me into a spiral of thought ending with, well what's the point of a restaurant like this? What's the point of paying €200 for a meal? There's no extra level of taste exclusive to that kind of dining, you can also get the best meal of your life for €6 at a gelateria.

What you're paying for are ideas. Literally. The labour cost involved in taking the time to think of new and interesting ways to cook and serve the same ingredients. You're paying for food that's conceptual, food that represents stories, abstract concepts and the identity of the chef. They are often as much pieces of art as they are pieces of food.

There's something admirable in that because I think food is at its most powerful when it has meaning. The reason I'd enjoyed that gelato so much wasn't because it was the single best serving of gelato on earth, it probably wasn't that different to a good





pistachio gelato in Sydney or Hong Kong. I loved it because it was my birthday, I was seeing a beloved friend for the first time in years and this was our first meal together.

I know Massimo Bottura (the acclaimed head chef of Osteria Francescana) puts his own memories and ideas in all his dishes but the problem is they're his memories and his ideas, and memories and ideas are extremely difficult to translate through the sensation of taste alone.

It's easy to feel emotional eating your mum's lasagna or your favourite childhood snacks but it's not easy to understand a story or feel a memory about the river Po just by eating a piece of eel and some grape juice syrup. You need more context.

This is why I don't understand why restaurants that produce art serve it in the most unartistic, unemotional way. Here is Massimo Bottura, a man with a million clever ideas, cooking a dish layered with meaning and presenting it on the same thing everything is served on, a plate. Then it's delivered by a suited waiter to a white tablecloth and two whispering customers.

Maybe the best way to eat the Bottura's 'eel swimming up the Po' is on the river itself. Instead of a suited waiter, maybe an eel farmer could serve it to you with a story of how he caught it ...

Imagine a riverside shack only accessible by raft? Flies are whizzing around and there is a trumpeter playing whatever you ask. It stinks like dirt but when your raft pulls up to the shack the earthy smell is beaten out by a broth stewing just beyond the shack's front door. You sit down on a rocking chair and a chef comes out with a pot of pho. They hand you a cork hat and ladle you a bowl while the trumpeter asks you some friendly questions about life.

How about a restaurant with a conveyor belt at the entrance? To get in you need to run for a kilometer with weights tied to your shoulders. Inside, there's a massive pile of sand and air con blowing like an arctic gale. You lay exhausted on the cool sand when the previous diner comes in and hands you a rindless slab of perfectly ripe watermelon sandwiched between two slices of

soft sponge cake, and a cube of deep fried gratin.

What about an entirely red room with a single red table and a red chair? There's a soft track of jarringly experimental jazz-rock playing and in the middle of the table is a white, pineapple-flavored cake. It's got the texture of meringue on the outside and thick custard in the middle. When you touch it, the jazz stops, and a Whitney Houston song plays. There is no cutlery.

These are fantastical ideas and I'm not suggesting they'd be the best restaurants on Earth, who knows if they'd actually be enjoyable. What I am saying is that Osteria Francescana and the other San Pell 50 best aren't the tastiest restaurants on Earth—they're not even the most enjoyable. The reason they're so lauded is their attention to ideas but the only medium they're playing with to sell those ideas is what's served on the plate. I applaud them for that, for making food into art. But I think we need to be more demanding of everything else a €200 restaurant does. Where is their creativity, emotion and pleasure in service? Where is the imagination in the sounds, the textures and visuals of a restaurant? If the food you're serving is art, there should be art in how it's served.

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# Clean Eating

*Karma Eddison-Cogan*

Clean eating holds the same persuasive, gratifying charm of Omo, which, as Roland Barthes writes, holds dirt as the “diminutive enemy”. Like the detox diet, which aims to cleanse the body of exogenous toxins by excluding certain foods, clean eating has a strong appeal. Similar to recent trends towards decluttering and minimalism, it offers the sense that we can be completely sovereign over our lives and consumptions. To rid oneself of wastes, excesses and accumulations, whether food or objects, is said to rejuvenate and re-enliven one’s self and one’s life.

The lifestyle package that accompanies clean eating promises all of the good and none of the bad. High-contrast, high-saturation images of fruits and vegetables curated by slim, smiling white women promote freshness, beauty, health, purity, healing, wholeness and wellness – think Gwyneth Paltrow and goop.com. At the same time that we assert these things to be unexamined positives, we exclude the non-ideal. Clean eating enforces moral boundaries between good and clean, and at the same time evokes shadows of its opposite: food that is loaded with excesses, over-processed, over-refined, over-handled and considered dirty. This is not inherently dirty food but is formed as such in association with its opposite; it is clean eating itself that creates the notion of unclean eating.

Unclean, dirty, excessive, or junk food generates images of unclean bodies, excessive bodies, couch potatoes, unruly populations. Calling something unclean is a powerful way of excluding it: it conjures up feelings of disgust and shame, and labels us in certain ways when we cross acceptable boundaries.

Desire often crosses different directions. At the same time as clean eating involves filtering what gets put onto the plate, there is a strong campaign to salvage food that would have ordinarily been classified as unsuitable for the consumer. Farmers’ crops, the “imperfect picks” that would routinely be discarded before reaching the supermarket, are now sold at a lower price as a way of reducing food waste. No longer wasted “matter out of place”, using anthropologist Mary Douglas’ influential phrase, irregular foods can integrate into our current realms of acceptability.

In its framing of food and the desires associated with food, clean eating creates a world of moral opposites. Looking beyond the boundaries of these categorisations, we can come to accept difference and take on new kinds of knowledge. Perhaps, a desire that is outwards-looking, a kind that can shift and open up new possibilities for being, is one step towards getting there.



