

'An exhilarating book... No serious wine lover's library is complete without it'

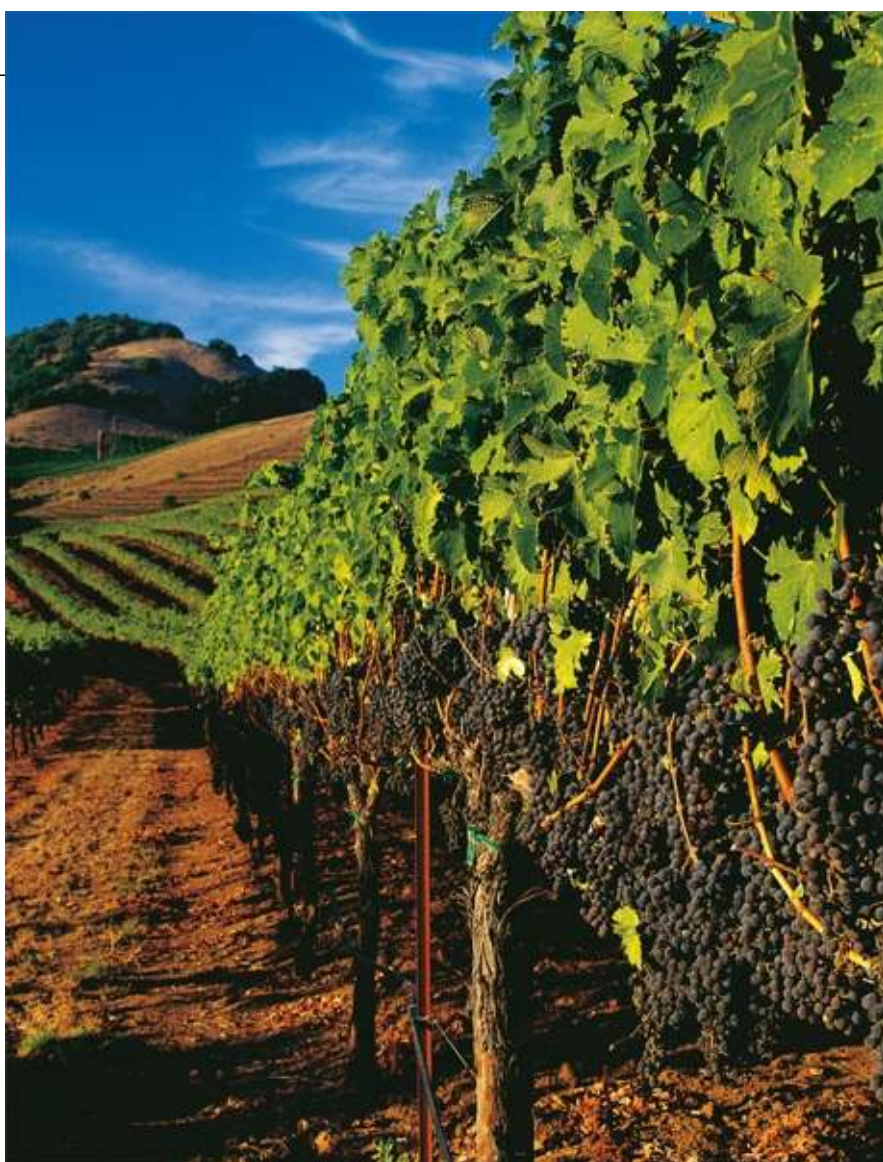
WINE SPECTATOR

OZ
CLARKE
& MARGARET RAND

GRAPES & WINES

A COMPREHENSIVE GUIDE TO VARIETIES & FLAVOURS

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PAVILION

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Cabernet Sauvignon



Muscat



Sémillon



Chardonnay



Nebbiolo



Syrah/Shiraz



Chenin Blanc



Pinot Noir



Tempranillo



Garnacha Tinta/Grenache
Noir



Riesling



Viognier



Gewürztraminer



Sangiovese



Zinfandel



Merlot



Sauvignon Blanc



Major Grapes

Albariño
Barbera

Dolcetto
Malbec

Mourvèdre
Pinot Blanc

Roussanne
Silvaner

Cabernet Franc

Malvasia

Pinot Gris

Touriga Nacional

Carmenère

Marsanne

Pinotage

INTRODUCTION



Chardonnay and Pinot Noir are just about two of the most famous classic grape varieties in the world. Both hail from Burgundy and are responsible for two of the world's most magical wine styles – Pinot Noir for haunting sensuous reds and Chardonnay for stunningly rich, honeyed, nutty, oatmealy whites. Yet isn't it strange that neither red or white Burgundy trumpets the grape names on the label?

So what is a grape, then? Well, it's juice and flesh, obviously. It's skin, obviously. It's pips, and I suppose it could be the stalks as well. And then what? And then everything, that's what.

If we have any interest in wine and in flavours, we have to be interested in the grape variety itself. If we have any interest in how a wine matures and changes with age, we have to know about the potential of the particular grape. If we care about the style of a wine, whether it should be sweet or dry, fizzy or fortified or still, each different grape variety's peculiar talents will be of prime importance. Do we like the flavour of oak barrel aging in our wine? Some grapes take to oak, again some don't – it's vital to know which ones love the kiss of oak and which ones loathe its hot embrace. And are we fascinated by how completely different wines taste when they come from different countries and from different regions within those countries? Without the consistent character of each different grape variety to use as a measuring point, mere comparison of place would be meaningless. However far we delve into all the things that influence the flavour of our wine, it all comes back to the grape.

I mean, think about it. I give you a glass of pale golden green wine. It's got a wonderful pungent scent of gooseberry and passion fruit and lime. You taste it and the acidity crackles against your teeth, the exhilarating attack of citrus fruit scours your palate clean and makes your mouth drool with desire for food. Who made the wine? No idea. Where does it come from? It could be the Loire Valley in France. But it could also be South Africa or Chile, it could be Spain or northern Italy. And it could certainly be New Zealand. So. The four corners of the earth really. But the grape variety? When the wine smells and tastes like that, you know it is Sauvignon Blanc. The unique, brilliantly recognizable character of the wine is down to the grape variety – Sauvignon Blanc – above all else. It is refined by the relative talent of the men and women who grow the grape and vinify the wine. It is modified or intensified by the local conditions under which it grows. But the core of the flavour comes from the grape.

Now, Sauvignon Blanc is a very dramatic grape. But so is Viognier with its powerful scent of apricot and mayblossom. So is Gewürztraminer with its explosion of musky rose petals and lychees. So is Muscat with its overpowering aroma of hothouse grapes. Riesling is more subtle, but the unmistakable balance of high acidity with floral notes and citrus fruit is unique to the grape. Chardonnay's nutty, oatmealy ripeness is created with the help of oak barrel aging, but no other grape achieves quite that taste, however similarly you treat it wherever it is grown.

Red wine grapes are frequently less outspoken, and just at present the obsession with overzealous use of new oak to age wines is spoiling the thrilling

individuality of many grapes' flavours – but good varieties still shine through. Tannic sturdiness and blackcurrant fruit mark out Cabernet Sauvignon in a way no other grape can replicate. The ethereal scent and strawberry/cherry fruit of Pinot Noir, the damson fruit and violet perfume of Malbec, the sour cherry and herbal rasp of Sangiovese, the brilliant chocolate and smoky black plum blast of Shiraz – all of these experiences and many more are above all else due to the particular characteristics of the grape variety.

It is remarkable how, over the years, grapes seem to have been relegated to a subordinate role in wine books when they are so evidently of such massive importance. Well, one of the reasons has to be that until the advent of modern 'New World' winemaking techniques that allow the winemaker to pinpoint the potential flavour of the grape and then maximize it, I suspect that few people – winemakers, wine writers and wine drinkers all – actually had much idea of what a grape variety was supposed to taste like. It was easier to say that a wine had a particular taste derived from where it was grown, that it tasted of what the French call 'terroir'. Indeed, the wines often did have a minerally or earthy flavour which probably did emanate from the vineyard and from old-fashioned winemaking, rather than the actual grape itself. That's why, until recently, many experts and critics were obsessed with the minutiae of a wine's birthplace rather than its chief component – the juice of the grape itself.

But when the New World producers brashly barged their way through into our wine consciousness, everything changed. The Australians and Californians, New Zealanders, South Africans and Chileans didn't have much of a story to tell when it came to the traditions and historical importance of their vineyards – many of these selfsame vineyards had only just been planted. The one story they could tell and the one their ultra-modern winemaking allowed them to tell, was that of the grape itself and the flavour it imparted to the wine. Varietal labelling – labelling wine according to its grape variety – was one of the most revolutionary moves in wine of recent times, a brilliant stroke of democratization, opening up the wonderful world of flavour to millions previously bamboozled and excluded by the obscurity and unhelpfulness of most wine labels. It allows all of us to make informed choices about what we like and don't like, and makes it so easy to extend our knowledge and experience and pleasure. The grape variety blazes the way: everything else follows.

And there's never been a time when a book recognizing grape varieties as the most important factor in the flavour of a wine has been needed more. The 21st century has seen an explosion of interest, not just in the main varieties, but in the local grapes of every area that grows wine, the ancient varieties facing extinction and the ones previously thought of as dullards, or as too much trouble to grow.

Suddenly we're interested in all of these. Social media spreads the word in seconds. Winemakers (wherever they are) have no qualms about planting experimental varieties. Indeed, it's almost a badge of honour to have something unusual and unexpected growing in your vineyard. And always with the objective of creating new, exciting, often unexpected flavours in your wine.

We are now seeing a progression as even the most futuristic of New Wave winemakers begin to search out the special characteristics of different patches of land – a return to terroir, I suppose. So does the grape variety simply become a vehicle for the flavour of place? Well, try planting Muscat or Malvasia or Marsanne in Meursault and see if you capture the compelling flavours of its vineyards. You won't. Chardonnay is indeed the vehicle for Meursault's unique personality and indispensable as such. But the grapes' unique characteristics are just as important as those of the vineyard – and a great deal more adaptable since they will express themselves in recognizable ways wherever the vine is planted.

Along with this move towards a greater understanding of each vineyard and its potential is a move away from relying solely on the best known grapes. Eighty per cent of the world's wine comes from a mere 20 grape varieties. We cover all these in great detail, but also examine hundreds more from every corner of the wine world, so that when you're ready to move out of the comfort zone, this book will be there for you, to encourage, to explain, to lead you on to the fabulous adventure of new flavours, new sensations, new pleasure. The world of wine with the wine grape at its heart – that's what this book is about.

While planning the project, I realized I simply couldn't handle it all by myself. I knew I needed someone to work with who was a first class wine intellectual who could shoulder the bulk of the research, make the best of the brilliant, up-to-date and minutely detailed data that we would obtain from every important vineyard area worldwide, and then put masses of often quite indigestible source material into a highly readable form. I also needed someone who, when I was flying off on my frequent flights of fancy, could rap me firmly on the knuckles and say 'Come on, Oz. Back to earth. This is a serious book of research as much as a joyous celebration of grape varieties in all their multi-flavoured glory'. Well, she didn't quite say that; she'd have edited out most of the final sentence for a start. But the person who shared in the creation of this book with me is Margaret Rand. And without her talent and determination we'd never have got it done.

A handwritten signature in black ink, appearing to read 'Oz Clark'. The signature is stylized and cursive, with the first name 'Oz' written in a large, looped script and the last name 'Clark' written in a more fluid, cursive style.



Double magnums stored away in the vintage bottle cellar at Château Canon-la-Gaffelière in St-Émilion, Bordeaux.

THE STORY OF THE VINE

The story of human cultivation of the vines is the story of the spread of civilization and the movement of populations. All cultivated vines – all 10,000 or so varieties of grapevine – are the descendants of wild vines. And while there doesn't (so far) seem to be an Eve-vine theory, to parallel the way that the study of mitochondrial DNA has hypothesized a single female ancestor for humanity, DNA studies seem to have pinpointed where the first vine was cultivated.

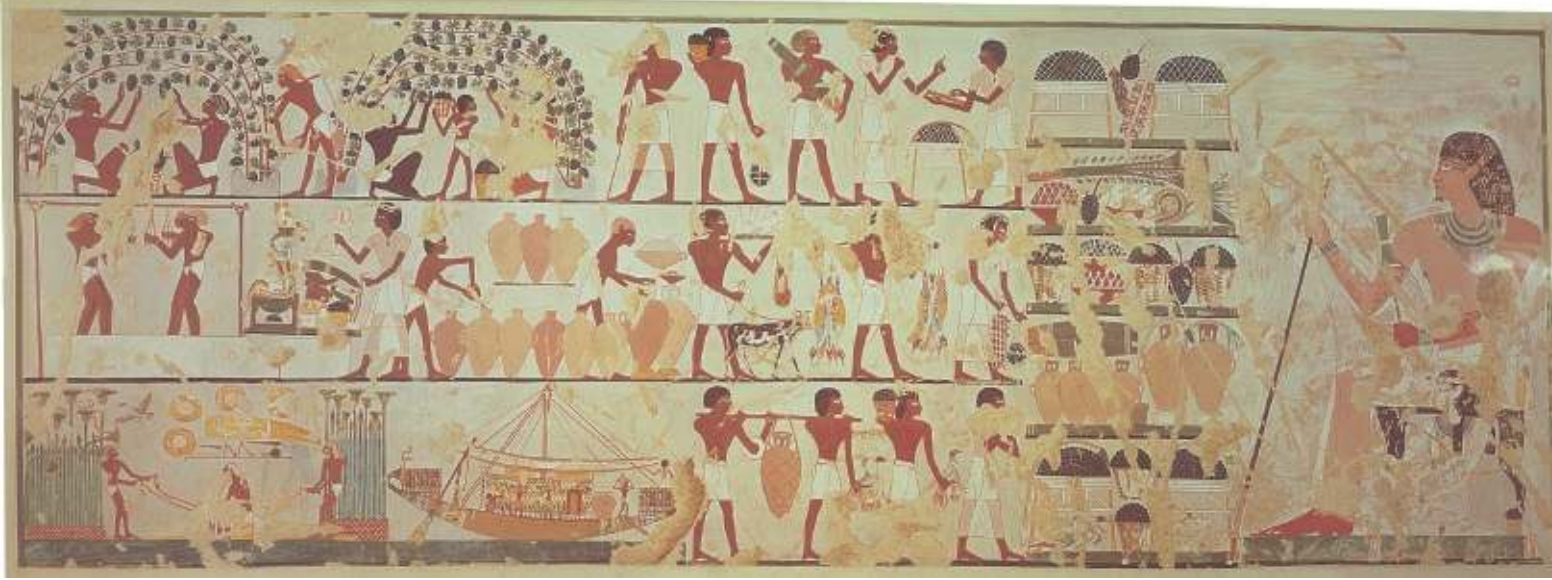
Or at least, they have pinpointed the two most likely places. Southeast Anatolia is one; Transcaucasia the other. The upper reaches of the Tigris and Euphrate rivers, in the Taurus mountains of eastern Turkey, are the favourite candidate. It's partly the enormous range of cultivated vines native to these regions that give the clue, and partly the close relationships between the DNA of local wild vines (which still proliferate here) and that of the local cultivated varieties. When did it happen? Presumably some while after humans discovered that wine – which will develop naturally, provided that ripe grapes are left in warm conditions for a few days – had an agreeable flavour and could cheer you up after a hard day. Wild grapevines would have been plentiful, and would have been a useful part of the diet. From grapes to wine is a very small step.

The step from wild vines to cultivated ones is bigger. Wild vines come in male and female versions; cultivated vines are hermaphrodite. The difference in the shape of the seeds is a useful clue for archeologists trying to determine if the inhabitants of a particular early settlement were cultivating the vine or not; but why should vines make this jump?

A tiny percentage of wild vines, maybe two or three per cent, are hermaphrodite. Hermaphrodite vines would be easier to cultivate and would produce a more certain crop, giving them an obvious advantage. So it's reasonable to assume that hermaphrodite wild vines are the probable forebears of our modern vines. Vines can be cultivated from seed, but every time a berry from an early vine fell to the ground and the seed germinated and took root, a new variety of vine would be born. Some would have found favour with early farmers for their sweetness and flavour and the attractiveness of their wine; others would have been dismissed. It took the introduction of propagation by taking cuttings in this way, every vine can be identical to its parents – for the cultivated vine to begin to squeeze out and dominate its wild family relations. Now we are on the way to today's 10,000 or so known varieties. How did *Vitis vinifera* come to be the chosen species? Well, probably a good old Darwinian process of its wines tasting better.

Surely humans in different parts of the globe would have discovered the same sort of thing independently? Quite possibly; but at the moment it looks as if other centres of early vine cultivation – the Iberian Peninsula was one, as was Sardinia – were not starting from scratch, because there doesn't seem to be any DNA relationship between early cultivated vines here, and wild ones.

Putting a date on the first cultivation of the vine, or the first wine, is a matter of guesswork at the moment, or romance. There is evidence of both wild and cultivated vines in sites dating from the Neolithic era (8500–4000 BC) in southeast Anatolia and Transcaucasia. The remains of liquid containing tartaric acid, identified by infrared spectrometry, have been found in Neolithic settlements from the sixth millennium BC in northern Iran; the presence of tartaric acid is a certain pointer to grapes. The liquid had been in stoppered jars, laid on their sides, and terebintine tree resin had been added as a preservative. Would they have gone to this trouble just to preserve grape juice? Maybe. But would they have been able to stop the grape juice beginning to ferment? That's what grape juice will always do, if you don't stop it, so isn't it more likely that these stoppered jars held this weird and wonderful nectar called wine, the bringer of joy and laughter and good times? So, who was first? Was it a mistake that turned out brilliantly? Well, an awful lot of the seminal moments in the development of all alcoholic drinks are 'happy mistakes'. And the chance fermentation of some wild grape juice was probably the first of the lot, lost in the mists of alcoholic time.



This copy of a wall painting from the tomb of Kha'emwese at Thebes, c.1450 BC, is both a technical aide-mémoire, ensuring that the departed will be well supplied with wine in the next world, and perhaps an expression of pleasure in all the different stages of the cultivation of the vine and the making of wine. For us it is also invaluable documentary evidence of how grapes were grown and wine made in an early but extremely sophisticated civilization. The viti- and vinicultural techniques shown here are far from primitive, even if the wines that resulted might not be to our modern taste.

It really shouldn't come as a surprise that the grapevine was first cultivated around the headwaters of the Tigris and Euphrates. The Fertile Crescent was where many 'founder crops' were first cultivated, those from which agriculture throughout the world is derived: chickpeas, lentils, rye, peas, emmer and einkorn wheat come from here. As do languages: all the Indo-European tongues which dominate Western European culture – and consequently much of the rest of the world – have been shown to have originated here. To say that wine and the vine are part of the warp and weft of human civilization is not an exaggeration.

Vitis vinifera and wine

All vines belong to the genus *Vitis*, which in turn belongs to the Vitaceae (formerly Ampelidaceae) family (see chart right). The *Vitis* genus includes around 60 species and is generally divided into two sections: *Euvites*, which contains nearly all the American, Asian and European vine species, including the European wine vine *Vitis vinifera*; and *Muscadiniae*, which is sometimes considered a separate genus. This book focuses on *Vitis vinifera*; other species of vine, like *Vitis labrusca*, *Vitis riparia* or *Vitis berlandieri*, are important to wine largely because they provide either directly or by way of crossings, the rootstocks on to which *Vitis vinifera* vines are grafted. (See [here](#).)

There are also hybrids: vines whose parents are of different vine species, as opposed to crosses, which have both parents of the same species.

The usual object of breeding hybrids is to combine some genetic advantage of *labrusca* or *rupestris* vine with the better wine flavours obtained from *vinifera*. Non-*vinifera* varieties give pungently scented wine often described as 'foxy' though the aroma is in fact more reminiscent of mayblossom or nail varnish. Maybe that's why winemaking was slow to catch on among the early settlers in North America whose native vines were all non-*vinifera*. But these vines may have resistance to disease (particularly phylloxera) or cold: hybrids of American vine with *vinifera* are widely planted in many more northerly states in the USA because *vinifera* vines find it difficult to withstand the winters. Seyval Blanc, a so-called French hybrid (French hybrids are a group of hybrid vines bred in France in the late 19th and early 20th centuries in an attempt to find a solution to phylloxera) was much planted in England until the focus of English growers changed to sparkling wine.

THE VINE FAMILY

Family

VITACEAE

The Ampelidaceae family

Genera

VITIS

Includes all vines which grow tendrils as a means of climbing

Sub-Genera

EUVITES

Contains most American, Asian and European vine species, the most important of which are shown below

Species

Vitis amurensis *Vitis berlandieri* *Vitis cinerea* *Vitis riparia*
Vitis aestivalis *Vitis argentifolia* *Vitis cariboea* *Vitis labrusca* *Vitis rupestris*

Vine species that may be useful as rootstocks or for crossing with *Vitis vinifera* to produce hybrids

Sub-Genera

MUSCADINIA

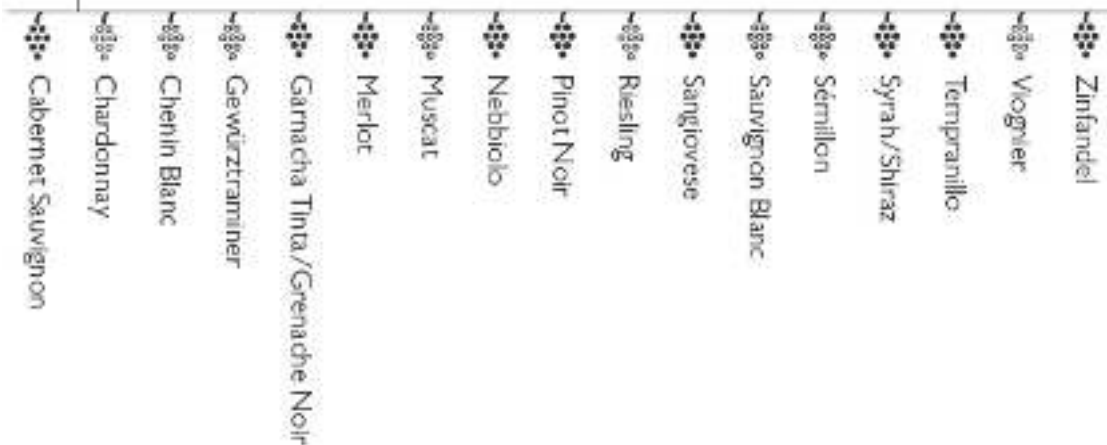
The Muscadine vine species are found in North America and Mexico; some are grown for wine with a strong musky flavour

Species


Vitis munsoniana *Vitis popenoei* *Vitis rotundifolia*

Vitis vinifera

The European vine species responsible for most of the world's wine production, including the classic wine grape varieties shown below



 Red grape

 White grape



*These look more like olives than grapes, but in fact they're a species of wild vine which Warren Winiarski of Stags Leap Winery in California unearthed on a fact-finding trip to Tajikistan in an attempt to shed light on the development of *Vitis vinifera* as a species..*



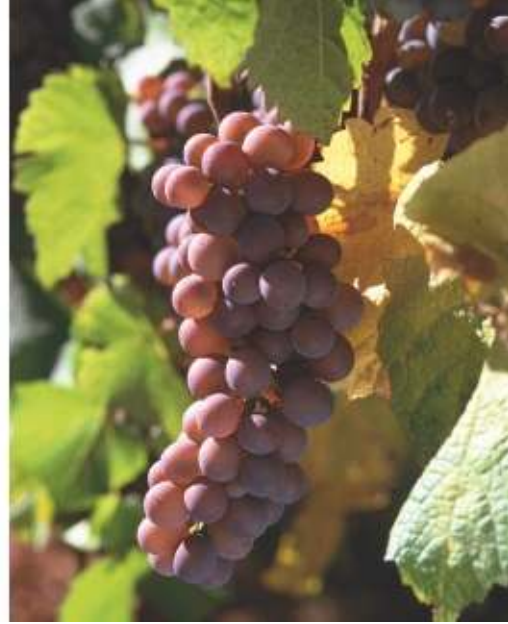
A 400-year-old tree vine of the White Horse Breast variety. No, I'd never heard of it either, but the ancient vine lands are full of survivors like this, and each one might have a fascinating story to tell, or part to play in the evolution of modern vines. This one is in the Samtskhe-Javakheti region of Georgia.

Hybrids are becoming increasingly sophisticated. There are some now being bred at research stations in Germany that are said to produce wine indistinguishable from the wine of certain *vinifera* varieties. These latest breeding involve not simply a crossing of an American vine with a *vinifera* vine, but numerous back-crossings to stabilize the European character. There is one, for example, that is said to be very close in flavour to Pinot Blanc, but which has no Pinot Blanc genes; another is said to be indistinguishable from Riesling, and does have some Riesling somewhere in its ancestry. The best red hybrids resemble Merlot, with good colour, low acidity, and blackberry-cherry fruit.

At the moment hybrids are not permitted for the production of quality wine in the European Union. And anyway, what the world seems to want at the moment are older varieties, preferably ones that are almost extinct, and can be rescued and propagated from three scrubby old vines growing in a corner of an untended vineyard 10km (6 miles) from the nearest road. The speed at which old varieties are being rediscovered is astonishing: most, truth to tell, were probably growing unacknowledged in old mixed vineyards, and not all are wonderful. Some will undoubtedly prove to be genetically the same as other varieties grown elsewhere; some may turn out to be missing links in stories of genetic relationships which are still incomplete. Ten years ago, the story of the vine seemed to be shrinking down to a tail-end of popular varieties, supplemented by new crossings; now we're rediscovering where we've come from.

But some just might completely transform our experience of what is possible in the spectrum of flavours. The guys who first planted the remote Waitaki area in New Zealand's South Island with vines said the flavours were so different from what had gone before, it was as if they'd discovered a new colour.

VINES TODAY



*To you, me and most growers – and indeed to every bureaucrat in charge of enforcing wine laws – Pinot Noir **(left)** and Pinot Gris **(right)** are different varieties. Try putting Pinot Noir on your label when you used Pinot Gris, and you won't get far. Yet to a geneticist they are the same, because they have the same DNA.*

Of the 10,000 or so varieties of grapevine, not all are cultivated for wine. Some are used for table grapes, some for raisins, and some are wild and shown no sign of pinning for the benefits of civilization. DNA profiling has established that some of the vines thought to be different are in fact genetically the same; and some thought to be the same are different. Vines are not quite what we thought. Fewer than 400 of those 10,000 are responsible for most of the wine we drink.

The vine, *Vitis* – whether *vinifera* or another type – has been on the planet a long, long time. It has had ample time to cross-breed. It also mutates constantly and unpredictably. It used to be thought that some vines, Pinot and Muscat being the ones usually cited, were more prone to mutation than others; now it's thought that the great age of these vines – they're among the oldest we have – accounts for their numerous variations. When it comes to mutation, *Vitis vinifera* can outdo most fruits: its heterozygous nature (meaning that its already complex genetic pattern can be readily rearranged) enables it to adapt itself with surprising ease to new circumstances.

Which leads us to another question: at what point is a variation on an existing vine considered to be a separate vine variety? This is a complicated matter, and a grower's answer is different to the answer of an ampelographer (or vine geneticist).

To a grower, a vine is a different variety if it looks different. The points of difference that matter are the shape and appearance of the leaves – the depth of the indentations, the appearance of the veins – the hairiness of the shoot tips, the shape and tightness or looseness of the bunches, the colour of the berries, the appearance of the canes, buds, flowers and seeds. Thus, to a grower, Pinot Noir and Pinot Gris are separate varieties.

To vine geneticists like Dr Carole Meredith of the University of California at Davis (UCD), however, Pinot Noir and Pinot Gris are merely colour forms of the same variety. They have the same DNA, therefore they are the same vine. 'In genetic terms,' she says, 'each variety is descended from a single unique original seedling. All vines of that variety can be traced back to that original seedling and have been derived from it by cuttings or buds.'

Pinot Noir is notorious for its variation: some strains grow upright and produce large, loose bunches; others do the opposite. They can be so different in appearance, and the wine can be so different in quality and flavour, that as consumers we might be justified in wondering if all these different strains should really all bear the same name. Yes, says Meredith, they should. Their DNA is the same. To produce a new variety you have to produce a seedling. You can do this by crossing two separate varieties, but even a seedling of the same variety (*Vitis vinifera* vines, remember, are hermaphrodite) is unlikely to be true to its parent. (The propensity of *Vitis vinifera* to produce seedlings that are different to its parent is the reason why vine propagation is done with cuttings.) Vines may mutate so that they look different and even behave differently, but they are still

the same variety, and always will be; and this ability to mutate is one reason why the same variety can succeed in different climates and circumstances. And it is the basis of clonal selection.

What is a clone?

Good question. 'Clone' is a word that is going to crop up a lot in this book. If you take a cutting of a plant – it might be a vine, it might be a pelargonium – you have a clone. Any plant you grow from that cutting will be genetically identical to the first. Any properly observant grower will be aware of which vines in his vineyard are the best. They may be the healthiest, or they may give grapes that ripen a little earlier or a little later, or have particularly good flavours. Whatever the positive attributes, by propagating cuttings from those vines rather than others, that grower is practising a form of clonal selection.

Massal versus clonal selection

This 'home-made' selection is known as massal selection, which means a 'mass' of different cuttings from a vineyard are planted out, usually to encourage diversity and complexity of flavours – wine growers in traditional areas have been doing this for centuries. The alternative, clonal selection proper, is done in the laboratory: it involves taking cuttings from single vines that have been observed to be especially good in some way, and producing successive generations of identical vines from this lone parent. The object is not only to reproduce their good qualities, but also to eradicate their virus diseases.



Tissue culturing is a crucial part of the virus elimination process. The plantlet on the left is in a rooting medium to form roots, while the one on the right is now in a soil medium.

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