TERROIR

of Burgundy

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BOURGOGNES

L'âme des vins de la Terre

SUMMARY

Le terroir de Bourgogne

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I - Foundation

The foundation of the originality of Burgundy wines

The terroir, in Burgundy, is the basis of the Appellation d'Origine Contrôlée.

In Burgundy, terroir is a broad concept which includes both natural and human factors. It was wine growers, sometimes aided by the work of monks, who discovered, identified and then developed the terroirs. Centuries of hard work were necessary for this concept, whose origin goes back to the early Middle Ages, to be passed down to us and be officially recognized and described in the middle of the last century with the creation of the I.N.A.O. and appellations of origin.

Today, after more than 1000 years, the terroir continues to assert itself in Burgundy as a modern concept, copied all over the world because it represents and conveys values of origin, authenticity, tradition and typicity that are dear to consumers.

The basis of terroir is above all the sub-soil and soil from which the vine draws its nutrients and which create a secret alchemy of colours, aromas and flavours.

In Burgundy, the geological origin and the physical and chemical composition of the soils are highly diversified and vary from one vineyard to another, but also within the same vineyard, the same village and the same locality.

This explains why the Burgundian vineyard is like an immense mosaic made up of thousands of plots of land (called 'climates' in this context), often very small indeed (Romanée is the smallest appellation in the world with 0.8 hectare).

In spite of this diversity of soils, Burgundy has a certain unity of geology and soil and climate conditions from north to south: sedimentary soils composed of clay, marls and limestone, deposited here 150 million years ago in the Jurassic period on an even older substrate (250 million years ago) composed of granite, lava, gneisses and a variety of schist. The decomposition of marine sedimentary rocks is thus at the origin of the clay-limestone soils on which the Burgundian grape varieties can express their personalities to the full.

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• The Pinot Noir loves well-drained marl and limestone soils on which, depending on the proportion of limestone and the situation of the plot, it will produce a light, elegant red or a powerful, vigorous wine.

• The Chardonnay prefers marly-limestone soils that are quite clayey, where it develops all its elegance and smooth flavours. It is the proportion of clay in the soil which determines the more or less aromatic, full style of the great dry white wines of Burgundy.

If the nature of the soil is the key element of the terroir, many other natural factors have an influence on the quality, typicity and expression of a wine: the exposure to the sun of the plot of land, its altitude, the depth and drainage of the soil, the climatic conditions of the year, the micro climate and so on

Lastly, the role of man is a determining factor in the production of an appellation d'origine contrôlée wine: from the vine, with the choice and practical application of the cultivation methods, and pruning to the grape harvest, and in the cellar during the wine-making maturation processes.

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II- Native soil

2. Burgundy wine comes first and foremost from a terroir

When rules for the appellations d'origine contrôlée (controlled labels of origin) were drawn up in the 1930s, each French vineyard chose a determining factor: the property, the land entity in Bordeaux; the brand name in Champagne; the grape variety in Alsace; the terroir in Burgundy. The major reference here is not the estate, the brand name or the grape variety but the soil which, since the origin of Burgundy wine, has given each cru its historical and tangible identity.

We call it the 'climate': a strictly defined plot of land recognised for its qualities, bearing its name for centuries and comprising one or more place-names. Each climate produces its own appellation wine, sometimes with just one owner but often shared by several estates. This is the very idea of terroir, the most direct and sincere link between the vine and the wine. This explains the high number of Burgundy A.O.C.s (some one hundred), since they express real and strong personalities. Wine lovers are very aware of this. They take pleasure in knowing them and recognising them.

The terroir is a combination of many climatic factors: exposure to the sun and wind, susceptibility to frost, or the effects of the system of cultivation, etc. The soil and sub-soil are the hard base, owing much to geology, but also to phenomena such as erosion.

From the Auxerrois to the Mâconnais, the Burgundy vineyards stretch for several hundred kilometres covering three départments (Yonne, Côte d'Or and Saone-et-Loire). So the nuances are numerous, explaining the character of the crus and the aptitude of grape varieties to flourish there. But these always come within the same feature: the soul of Burgundy.

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II- Native soil

3. The gift of the sea

Take a stroll through the vines. It is not unusual to collect fossil shells there. They are a reminder that 200-250 million years ago (with the Earth now 4.7 billion years old) a hot shallow sea extended from the Jura to the region of Beauvais with a tropical climate. An emerald lagoon, a sea like that around Tahiti. Oysters, mussels, scallops, crinoids and starfish, algae and corals were deposited for millions of years and gradually built up into a "barrier reef" in sands and mud.

Calcareous sedimentation transformed these marine materials into hard rocks in the Jurassic period of the Secondary Era, 150 million years ago. The accumulation of these rocks exerted colossal pressure on the base, producing Comblanchien limestone, one of the marbles with the highest density, which often occurs near the Burgundian vine and from which man later built Orly airport and the Louvre pyramid.

In the Tertiary Era, 30 million years ago, a fracture occurred. The Alps reared up. This movement then drew the present relief of the Côte and the Hautes Côtes facing the Bressan trough. Other geological signs: small iron ore deposits on the surface of the soil that appeared 50 million years ago. This ferruginous presence is useful for the vine.

III - Northern Burgundy

Kimmeridgian Chablis

Seeking to define what makes their terroir unique and understandably tired of seeing the word "Chablis" indicating all kinds of wines on the planet, at the end of the 19th century, the wine growers of Chablis found a reference that seemed safe to them, thanks to Father George Chappaz (1904): the Kimmeridgian. This refers to several geological strata belonging to the Upper Jurassic, 150 million years ago. The rock base has a special characteristic: the abundance of a family of tiny oysters called Exogyra virgule, in the marls and the marly limestone. The Chablis vineyard is situated on these marls below the layer of Portland limestone (prolongation of the Côte des Bars in the Barrois): a landscape that typically has tree-crowned hillocks overlooking the vines.

Chablis is the only AOC vineyard to make express reference to a geological reality. Indeed the legal decision of 1923 indicates the Kimmeridgian as being an essential element of the best Chablis wines. The AOC everywhere were to take up former rulings, including this one. Scientific opinion has apparently evolved since then. In 1962 and 1967, international scientific conferences (without any relationship with the vine) added several tens of million years to the geological strata called Kimmeridgian.

Moreover, more precise studies show than while certain non-Kimmeridgian soils are perfectly suitable for Chardonnay, some Kimmeridgian soils sometimes produce less fortunate results. This does not detract from the importance of retaining the long-standing desire to link the appellation to a precise geological origin, nor can it alter the fact that Chablis Grand Cru, the standard-bearer of the vineyard, is authentically Kimmeridgian in character.

Although Chablis is dry, limpid, full of bouquet, lively and light, unlike any other child of the Chardonnay grape, if, in a word, it has love, it is because of the link that ties the stock to its soil.

The Tonnerrois vineyard lies on somewhat older Oxfordian limestone strata close to Chablis.

IV - From Dijon to Santenay

1. The Côte de Nuits and Côte de Beaune are of different ages

The Côte (from Dijon to Santenay) dominates the Bressan plain at a height of 150 to 200 metres; a fault line between the limestone plateaux (Hautes-Côtes) and the trough. Anticlinal undulation known as "of Gevrey" raises the Mid-Jurassic, revealing the Upper Jurassic. Synclinal undulation known as "of Volnay" lowers the Upper Jurassic to the Bressan level. Callovian, Oxfordian, Portlandian: these geological strata contribute to bases that vary according to their proportion of limestone or clay. The geological outcrops due to this fault line make it possible to understand the complexity of the terroir, the individual personality of each wine.

1.1 Rendzinas and limestone soils

In the Côtes de Nuits and de Beaune, rendzinas and brown limestone soils predominate, generally with a covering of scree. There is a mixture of gravel (broken up by frost) and red silt that has slipped down slopes onto marly bases or limestones.

The majority of the Grands Crus come from the middle of the slope. The arable land often only occupies a shallow layer, in close contact with the source rock, but the roots of the vine can thread through the slightest crack and sometimes reach down some dozens of metres.

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IV - From Dijon to Santenay

1.2 The Jurassic

The Côte de Nuits is older (Mid-Jurassic, 175 million years ago) than the Côte de Beaune (Upper Jurassic, 150 million years ago). Facing the rising sun, the Côte de Nuits follows a rectilinear axis while the vine plays leapfrog over narrow rocky steep-sided coombes.

The Côte de Beaune seems to follow the sun's daily course and slants gradually towards the South. Its coombes are gentler and the vine can be grown on their slopes. The Comblanchian limestone that plunged down at Ladoix reappears at Meursault.

1.3 The limestone slopes

The Pinot Noir is most at home on the limestone soil of gentle slopes well-drained by gravel: the excellence of the red Grands Crus, profound and subtle, whose body, bouquet and colour are in perfect harmony. These wines have great laying-down potential, derived as they are from such solid and lasting foundations. The more water-retentive alluvial clays at the foot of the slopes also yield powerful wines but with marginally less elegance.

The Chardonnay also flourishes on limestone slopes, preferring marly and sometimes very clayey formations: the Kimmeridgian marls of Chablis, the Oxfordian limestones of Corton-Charlemagne or the southern part of the Côte de Beaune. Here the grape develops perfect grace: the gold of alchemy, tinged with emerald; the subtle bouquet, a taste unique in the world.

As Pierre Poupon remarks: from the same grape, Chardonnay, Burgundy draws as many variations as the bow on a violin, from Chablis to Pouilly-Fuissé! Each is the product of its terroir, the good fortune of the year and the composers - the wine grower and wine maker.

Nature provides some excellent geological cross sections, the Montagne de Corton for example or the rock of Solutré in Mâconnais.

IV - From Dijon to Santenay

2. In the Hautes-Côtes

Montagne de Corton, is aptly named. A section through the Hautes-Côtes de Nuits, from the top down, exposes hard limestones, clays, pebbly limestone (on the flanks), and at the foot of the slope, limestone pavement and gravel. Average altitude: 300-400 metres. There is more air movement between hills and valleys and the climate is somewhat harsher.

While the Hautes-Côtes de Nuits occupies a plateau clearly defined by the edge of the Côte and the valley of the Ouche, the Hautes-Côtes de Beaune extends further into the country behind the Côte proper.

In the Hautes-Côtes, Rauracian limestones break the surface. Limestone soils alternate with marls, with the appearance of the oldest Jurassic beds, (between Mavilly-Mandelot and La Rochepot for example). This no doubt belongs to the same formation. These wines belong to the same family. The landscape is of hills and valleys, “leaping and gambolling” as Montaigne put it, making for interesting diversity from village to village.

Full of fire, energy and lightness, "almost all spirit” as they used to say in the 18th century, the red wines of the Hautes-Côtes are fruity and, without being too robust, smooth on the palate. The Aligoté-based whites may sometimes have a little too much bite, but those from the Chardonnay have all the mellowness that could be desired.

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V - The southern vineyards

1. The Côte Chalonnaise: from granite to limestone and marls

The Côte Chalonnaise forms part of the north-east face of France's granite Massif Central. The Bressan trough was formed in the upheavals of the Tertiary era. Multiple faulting broke up the southern section of the Burgundian Côte. In the north of the district are east-facing Jurassic limestone formations. Beyond the fault line of Bissey, Jurassic limestone dominates (Rully, Mercurey and Givry), but in other villages Liassic and even older Triassic strata appear on the surface.

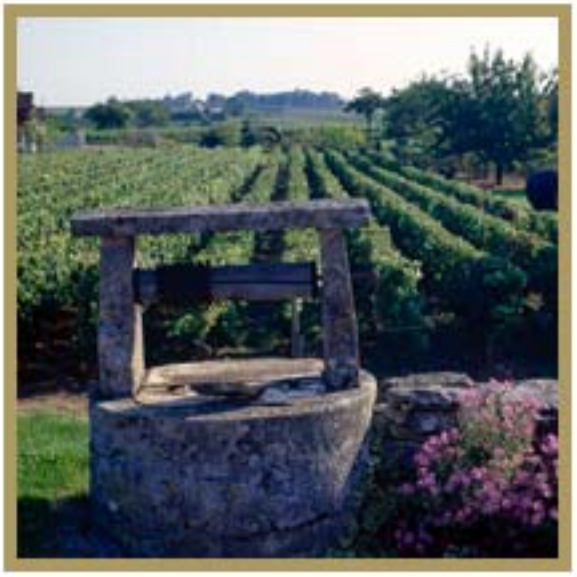
To the south of the granite block of Bissey, the slopes face either east, or west towards the first hills of the Mâconnais. Here in a few places quartz-rich Triassic sandstones meet the alluvial soils of the Saône river-plain. The soils appear marlier, topped by the Bajocian limestone ridge.

The base of the hills is covered with sand and areas of clay with flint. Some of the soils are Liassic/Triassic assemblages with a high proportion of clays. Others are Mid and Upper-Jurassic assemblages where beds of hard limestones alternate with softer marls, and these yield lime-rich brown soils and rendzinas, deep in places and mixed with clay.

The best Chardonnay-derived white wines are produced from clay-limestone soils with easterly, south-easterly or southerly exposures, as at Rully and Montagny.

The best reds (Rully, Mercurey, Givry) from the Pinot Noir are found on less clayey calcium-rich soils. The Gamay, a white-juiced black grape, prefers granite soils.

On the lower slopes, pebbly alluvium overlies the limestone, yielding leached-out brown soils which favour both the Gamay and the Aligoté.



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V - The southern vineyards

2. In the Mâconnais

The hills of the Mâconnais form a linked series along an axis from north-north-east to south-south-west, separated by parallel faults. Bordered on one side by the River Saône and on the other by the Grosne, they present a series of sharply-defined wooded summits looking down on sheltered depressions where the vine flourishes. Variations in landform lead to a diversity of soils. Rendzinas and brown limestone soils suit the Chardonnay. Flinty, clayey or sandy soils, often mixed with sandstone pebbles, are more suited to the earlier-maturing white grapes and to the white-juiced black Gamay, which grows as well here as it does in the geologically similar Beaujolais vineyards.

With its foundation of limestone identical to the Côte, the rock of Solutré, home of Pouilly-Fuissé, is a Bajocian escarpment that owes the sharpness of its profile to the hardness of the fossilised corals of which it is composed, resistant to erosion.

The vines grow around the base of this rock on reddish Liassic marls washed down from above and covered with limestone scree.

VI - The soil

3. Preserving the treasure

3 . 1 The answer is in the soil

The sun works on the vine through photosynthesis. Meanwhile, below ground, the roots are pulling in from soil and sub-soil (limestone especially, but also clays and gravels) the nourishment which gives the vines their vigour and determines their character. The elements assimilated through the roots have their effect on the fertility of the plant and the quality of its wines.

Research going back thirty years has revealed the crucial importance of trace elements. And more recent fundamental and applied research has concentrated on the role played by living organisms in the soil, both macro-organisms visible to the naked eye (insects and invertebrates as well as the roots of the vines themselves) and micro-organisms (amoebae, algae, fungi, and bacteria.) Millions, if not billions, of living micro-organisms are contained in a single gram of soil.

The lesson to be learned here is that this sensitive complex of living organisms is a precious heritage whose vitality it is our duty to protect and nurture. As a result, our ideas on the best way to treat the soil and sub-soil have undergone radical revision following careful and minute study. Minimum impact is now the goal and modern techniques of viticulture reflect this ideal.

3 . 2 The soil

After the first mildew attacks in the 19th century, all the wine-growing regions had recourse to copper-based fungicides ("Bordeaux mixture") and no modern replacement has yet been found for these. Nitrates and potash were used as fertilisers.

Whatever the source of these chemicals, Burgundian viticulture today tends more and more towards low-input methods. The substances employed and the manner of their application are becoming increasingly subject to strict regulation. The object, without question, is to produce better wines (better, too, for the health of the drinker) but also to guarantee to future generations the continuing capacity of the soil to maintain the personality of the terroir and the cru.

As in the fable, the treasure is here in the soil. It is our buried treasure, to be protected against dangers from outside, erosion for example, that can rob it of its natural character. Aeons of time have gone into its creation, while our acquaintance with it has been brief. But the Burgundy of today knows how to preserve this precious treasure to hand it on to future generations.