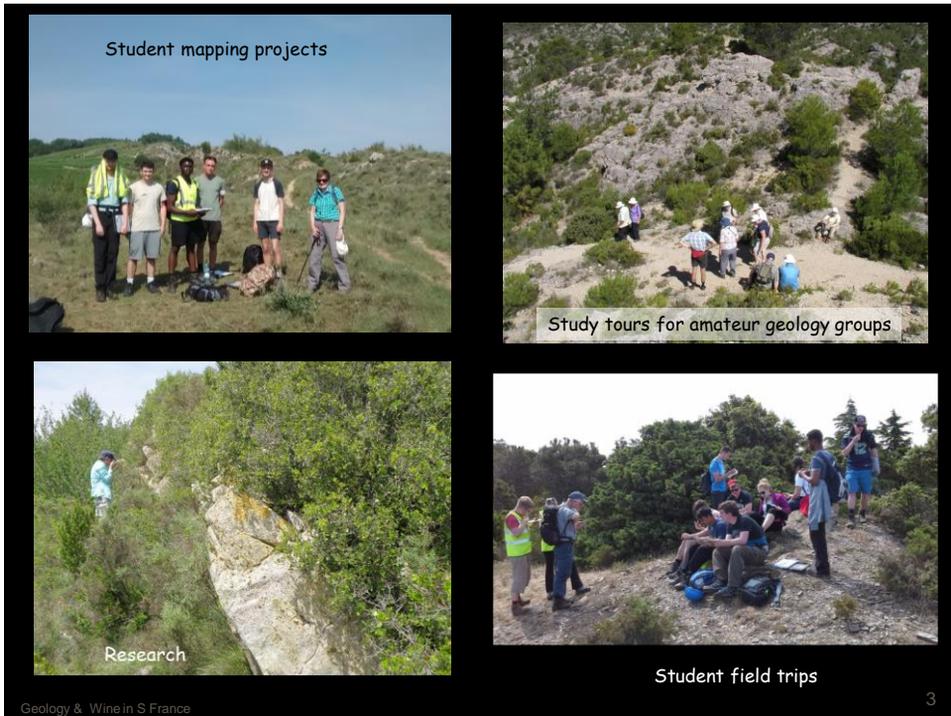


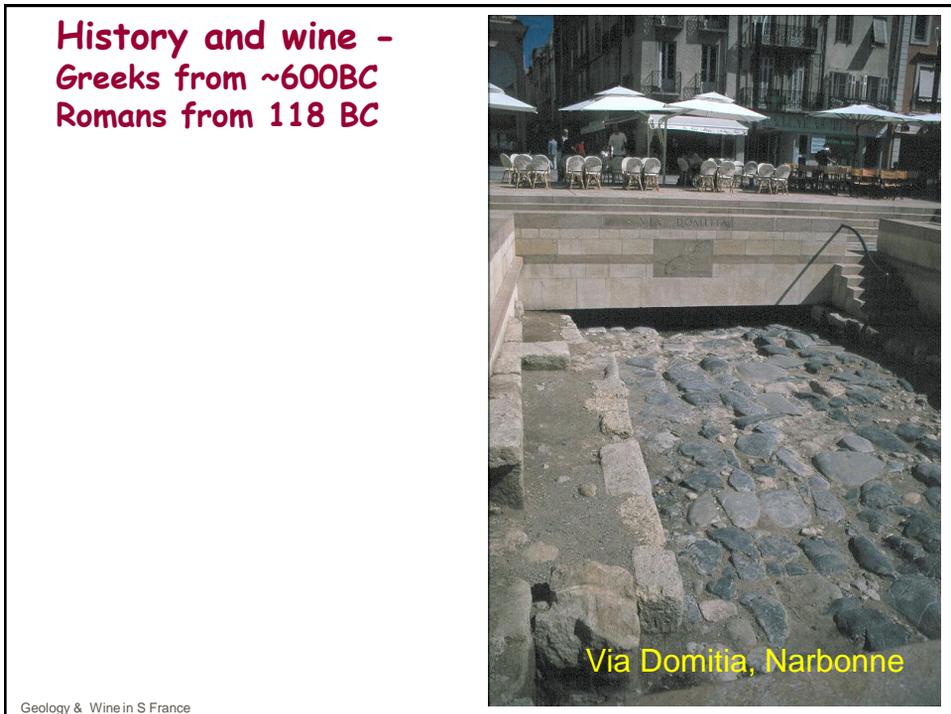
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History and wine - the mediaeval church



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5

5

Sparkling wine

Blanquette de Limoux:
first recorded 1531;
discovered at Abbaye
de St Hilaire (long
before Champagne!)

- **Tesco Finest 1531 Blanquette de Limoux** £9.50
- Mauzac, Chardonnay, Chenin Blanc
- AOC Blanquette de Limoux
- Upper Aude valley, S of Carcassonne
- Pyrenees foothills: folded Late Cretaceous – Eocene continental & marine sediments
- Hand harvested; 2nd fermentation in bottle; aged 12 months
- 12.5% alcohol by volume (ABV)
- Sieur d'Arques: co-operative of 199 vigneron
- 2800 hectares AOC vineyards
- Also excellent still wines from Chardonnay

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6

6

History and wine - Canal du Midi



- Pierre-Paul Ricquet
- Louis XIV
- started 1666, completed 1681
- Linked Mediterranean to Atlantic
- transported wheat, wine, marble...

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7

Vines and wines



8

Languedoc-Roussillon wines

- ❑ Largest contiguous wine-producing area in the world
- ❑ 246,000 ha vineyards (608,000 acres)
- ❑ 34% of French wine
- ❑ 40% of French wine exports
- ❑ 5% of world wine production
- ❑ ~ 1,360,000,000 litres / year
 - ❑ red 76%; rosé 14%; white 10%
- ❑ = 1.8 billion bottles



2017 figures from socialvignerons.com

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9

9

In Languedoc-Roussillon...

Cave co-operative, Tautavel



Private winery, Campagne-sur-Aude



- ❑ ~280 *caves co-operatives* + >20,000 private producers
- ❑ Over the last 30 years:
 - ❑ quantity ↓
 - ❑ quality & prices ↑

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10

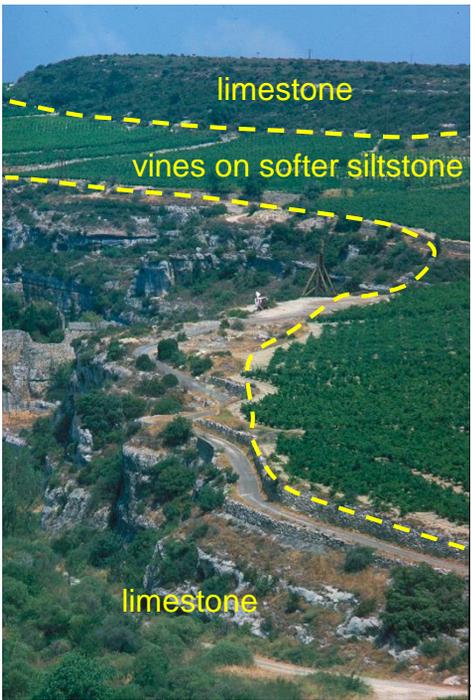
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Geology and wine

Is there a connection ??



Vineyards on gently dipping Eocene, Minervois



limestone

vines on softer siltstone

limestone

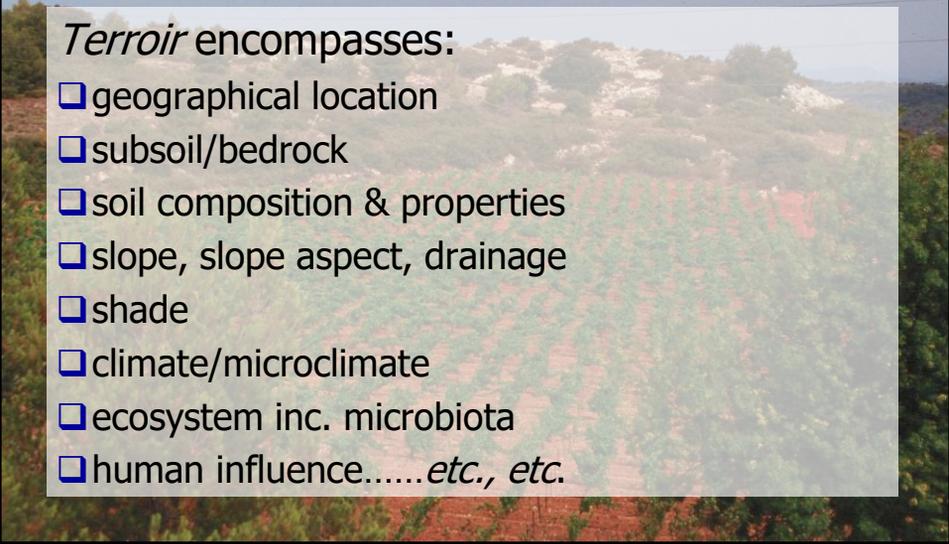
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11

“Terroir – the combination of geography, geology, and climate that gives each wine its special character”
 – Charles Frankel (2014). Land and Wine: The French Terroir

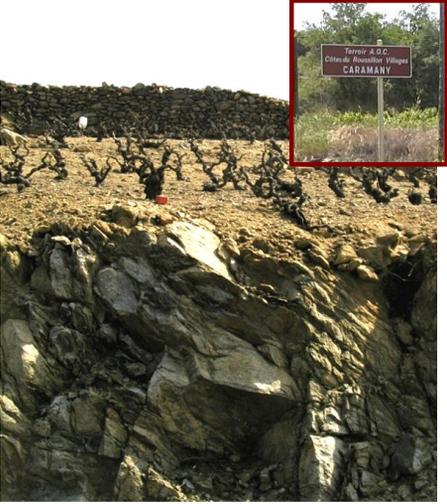
Terroir encompasses:

- geographical location
- subsoil/bedrock
- soil composition & properties
- slope, slope aspect, drainage
- shade
- climate/microclimate
- ecosystem inc. microbiota
- human influence.....*etc., etc.*



12

Terroir: Stony soils




Some of the best vines of Côtes du Roussillon-Villages, growing in ± solid gneiss, Agly Massif: Variscan basement

- Many grape varieties 'prefer' well-drained stony soils on a slope
- reflect and diffuse sunlight to lower leaves
- absorb heat by day, release it at night
- conserve moisture

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13

Comparison of soil chemistry and geomorphic factors in two selected vineyards – Southern France

Terroir: Soil composition



Independent project: Kayleigh Skipper : 3rd year BSc (Hons) Geography and Geology, University of Derby

14

Terroir: Topography



E-W limestone ridges, Hautes Corbières & Côtes du Roussillon

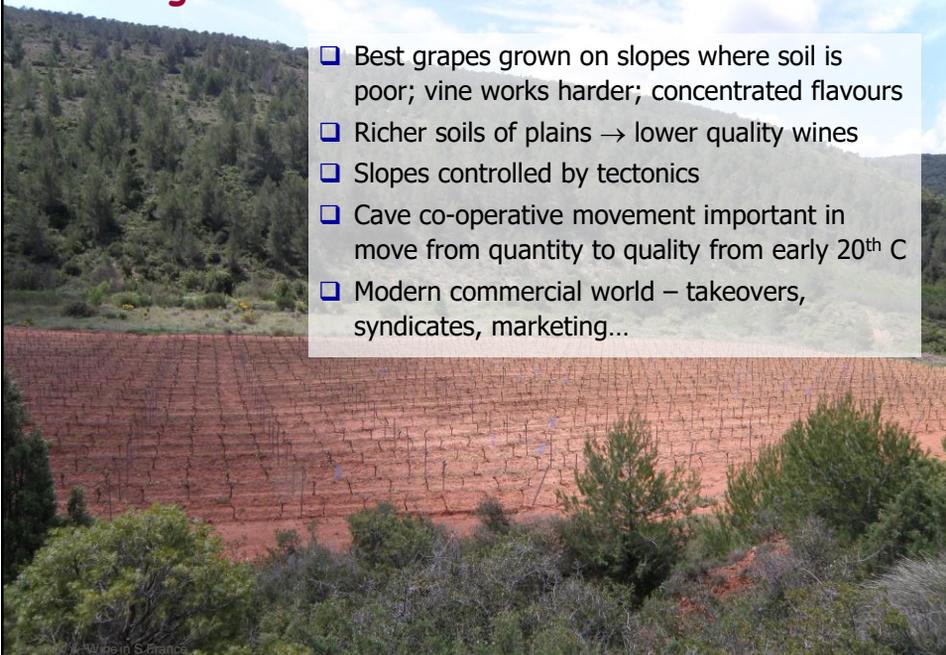


E-W limestone ridges, St Chinian: vines on N-facing slope

- ❑ Landscape has strong control on vine growth & grape quality
- ❑ topography & slope largely determined by geology
- ❑ geological **structure** is particularly important in controlling landscape: many E-W ridges in Languedoc

15

In Languedoc-Roussillon...



- ❑ Best grapes grown on slopes where soil is poor; vine works harder; concentrated flavours
- ❑ Richer soils of plains → lower quality wines
- ❑ Slopes controlled by tectonics
- ❑ Cave co-operative movement important in move from quantity to quality from early 20th C
- ❑ Modern commercial world – takeovers, syndicates, marketing...

16

Appellations - Reforms to system 2006-2012

- ❑ 3 categories
 - ❑ *Vin de France*, a table wine category replacing *Vin de Table*, but allowing grape variety and vintage to be indicated on the label.
 - ❑ *Indication Géographique Protégée* (IGP), intermediate category replacing *Vin de Pays*.
 - ❑ *Appellation d'Origine Protégée* (AOP), the highest category, replacing AOC (but AOC is still allowed & used)
 - ❑ Europe-wide – includes other food products

17

Traditional Languedoc grapes

- ❑ **White:**
 - ❑ Good wines are made from grapes you haven't heard of!
 - ❑ Good wines are blended from several grape varieties
 - ❑ Increasing amounts of non-traditional grapes, e.g. Chardonnay
 - ❑ ABC



18

Traditional Languedoc white

- **Sainsburys Languedoc White**, Taste the Difference. £7.50
 - Grenache blanc, Marsanne, Vermentino
 - AOP Languedoc Blanc – regional appellation
 - 13% ABV
 - Jean-Claude Mas

- **Tesco Finest Picpoul de Pinet** £7.50
 - Picpoul (Picquepoul) blanc
 - 13% ABV
 - AOP Picpoul de Pinet
 - Continental marls & conglomerates: Late Cretaceous-Paleocene + Pliocene
 - Locals: "vines need to have heads in the wind and feet in the sea"
 - Co-operative Les Costières de Pomérols: 350 members

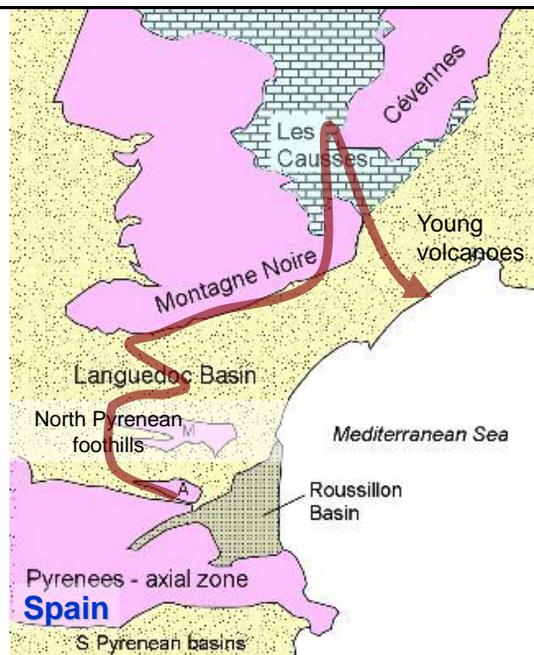
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19

19

Languedoc Geology

A geological journey through the wine regions



BRGM 1:1,500,000 Feuille Sud

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20

20



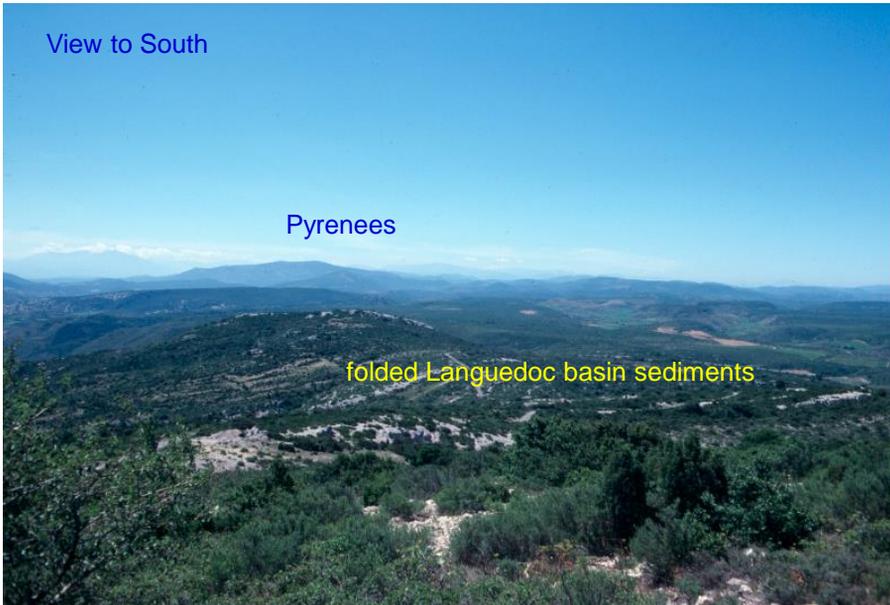
21



22

From foothills to basin: Corbières

View to South



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23

23

Traditional Languedoc grapes

- ❑ **Red** - same grapes for **rosé**
- ❑ Good wines are made from grapes you haven't heard of!
- ❑ Good wines are blended from several grape varieties
- ❑ Increasing amounts of non-traditional grapes, *e.g.* Cabernet Sauvignon



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24

24

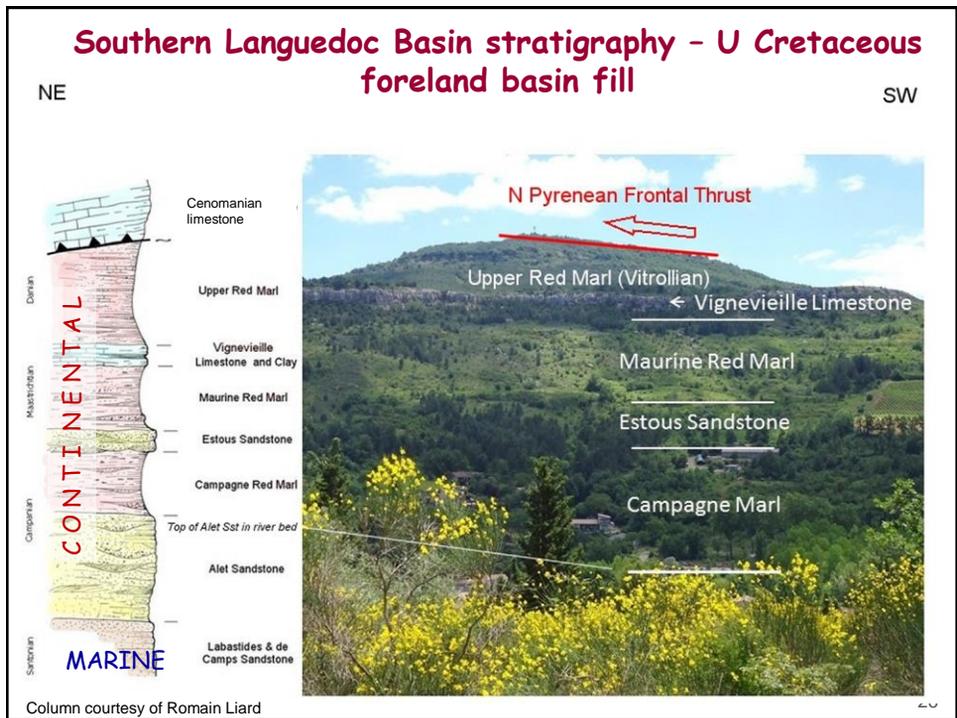
Traditional Languedoc rosé - not just for summer!

- ▣ **Sainsburys La Terrasse Rosé Pays d'Oc** £8 - £10
 - ▣ Grenache noir, Syrah, Cinsault
 - ▣ IGP Pays d'Oc – regional appellation
 - ▣ 12.5% ABV
 - ▣ Jean-Claude Mas

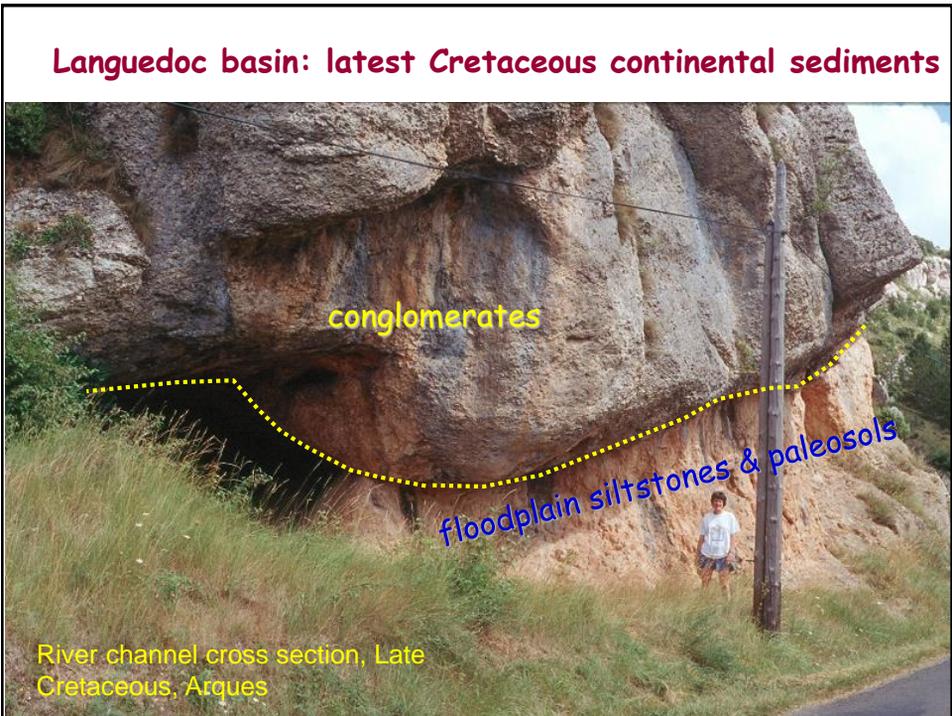
- ▣ **Tesco Gem Pays d'Oc Rosé** £8.50
 - ▣ Grenache noir, Syrah, Cinsault
 - ▣ IGP Pays d'Oc – regional appellation
 - ▣ Lower terraces of the Hérault river valley
 - ▣ 12.5% ABV
 - ▣ Vignobles Jeanjean

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25



26



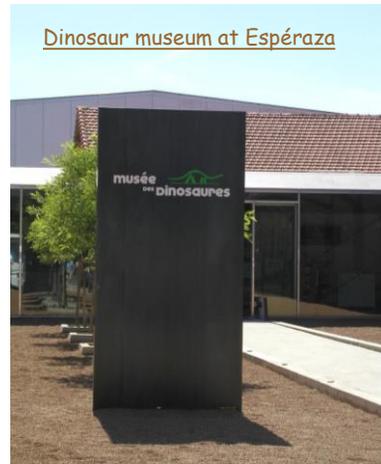
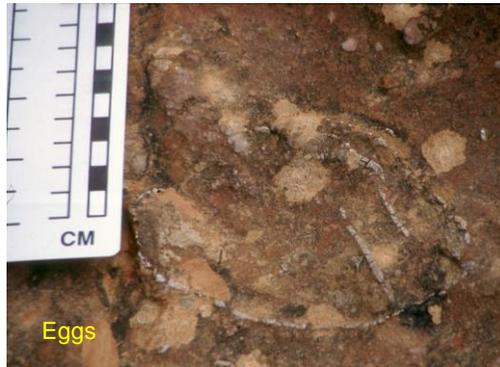
27



28

28

Languedoc basin: Late Cretaceous dinosaurs!



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29

29

Languedoc basin: early Eocene shallow marine sediments



30

Mid-Eocene river systems

Molasse de Carcassonne

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31

31

North across the Languedoc Basin to the Montagne Noire

32

Traditional red

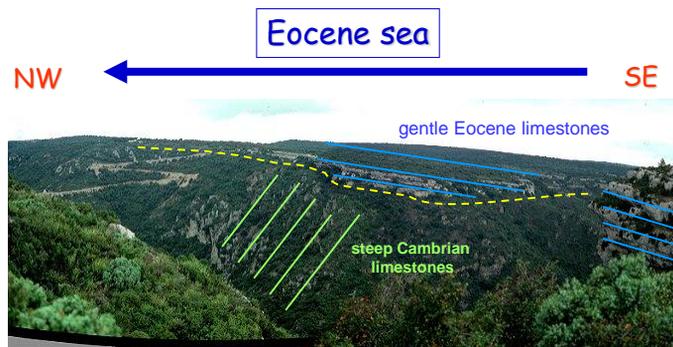
- **Sainsburys Saint Chinian,**
Taste the Difference £8 - £9
- Syrah, Grenache noir
- AOP St Chinian
- Late Cretaceous – Eocene marls, clays & limestones at N edge of Languedoc foreland basin
- 14.5% ABV
- Laurent Miquel

- **Tesco Finest Faugères** £8 - £9
- Carignan, Syrah, Grenache noir
- AOP Faugères
- Stony soils on Palaeozoic of Montagne Noire
- 12.5% ABV
- Vignobles Jeanjean

33

Montagne Noire: Minervois

Paleogene unconformable on L Palaeozoic



34

Fortified dessert wines

- ☐ Vins doux naturels
- ☐ Lightly fortified, ~15 - 16%
- ☐ White – Muscat grape
 - ☐ Muscat de Rivesaltes
 - ☐ Muscat de Frontignan
 - ☐ Muscat de St Jean de Minervois...
- ☐ Red – Grenache noir grape
 - ☐ Maury
 - ☐ Banyuls
 - ☐ Rivesaltes...

35

Vin doux – fortified wine

- ☐ **Sainsburys Les Jardiniers Muscat de St Jean de Minervois** £5.25 (half bottle)
- ☐ Muscat blanc à petits grains
- ☐ AOP Vin Doux Naturel
- ☐ High vineyards in Eocene marls & limestones on very N edge of foreland basin
- ☐ 15% ABV (lightly fortified)
- ☐ Co-operative: Les Vignerons de Saint Jean

36

Montagne Noire: post-Variscan extensional basins







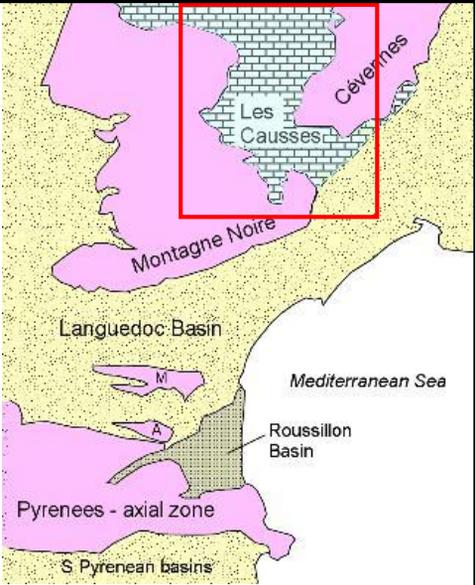
Lodève Basin - Permian

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37

The Limestone Plateaux (Les Causses)





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38

The Limestone plateaux - geology and cheese



Roquefort-sur-Soulzon

Caves Papillon,
Roquefort



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39

Post-Pyrenean sediments

Oligocene - Miocene
rift basins on the
W Mediterranean margin

Gypsum mine, Terra Vinea, Corbières



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40

40

Miocene: Mediterranean highstand sediments



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41

Pliocene-Pleistocene volcanoes



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42

42

Tasting...a part of Geoscience education



University of Derby 3rd year Basin Analysis-Crustal Evolution field trip, French Pyrenees

Geology and wine: virtual-geology.info/wine

Geology Today article & web site:
virtual-geology.info/regional-geol/pyrenees.htm