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VOYAGE IN SPAIN

OF HERMAN KNOGGE

BOTANICAL NOTES

JULY 6 1915

I abandon Spain. Montpellier for Spain.
after leaving the Mediterranean region
clear to Bayonne the greenness of the fields
is striking. Everywhere the harvest
of hay was on in the gardens a Catalpa
was in bloom. Depart from Bayonne
on the 7. THE hills of the Spanish frontier
are mostly barren: only an occasional
Betula or planted Pine is seen. A coarse
grass with Pteris aquilina dominate. With
Spain the peaks are higher; but the intense
green remains. A drizzling rain, or mist
accompanies us to the Castilian plain. We pass
through a cloak of clouds on the
divide.

The Basque country is carefully
cultivated. Perhaps none of the original
growth remains. Apples are abundant. TO the
top of the mountains (north slope Castilian
tableland) the flanks are covered by
woods of chestnuts and more or less QUERCUS
(SESSILIFLORA?) along the railroad we note
AILANTHUS, and always Robinia. Here a
CLEMATIS climbs 20 feet: HEDERA envelops

the trunks. Not a single old or well developed tree was seen in the land of the basques nor in Alava. Man trims as closely as possible, and thereby stunts growth.

Wheat is everywhere; sometimes alternating with potatoes; but maize is the great staple. Barren land is covered by a leguminous shrub "SARATHAMNUS" (or is it "GENISTA Scorpius" and is not so abundant of "Erica" in flower. A rank grass is common.

The dominant plant everywhere is however, *Pteris aquilina*. *Betula* is rarer. *Populus nigra* is the roasting tree. The chalets scattered on the mountain side with their whitewashed walls and wooden framework in the green landscape, remind one of Switzerland. All the buildings are festooned with *Vitis vinifera*. Gardens showed *Chamaerops*, *Laurus Tinus*, *Platanus*. Weeds;

Trifolium

Sambucus

Echium

Alch-milla (*Anthemis cotula*?)

Rubus

The summit of the Basque mountains is densely wooded with *Quercus* (deciduous) and undergrowth "Sarthamnus" and *Erica*. Dense fog and clouds obstructed the view. As we cross the divide the fogs disappear.

It is Alava! A few natural prairies; but wheat fields predominate. Oats are not rare. The sparseness and feebleness of the cereals testify to the dryness of the land. Beets and a (Cicer?) are seen, but maize and potatoes are rare. The ripening heads of the grain, now gives richness to the landscape. In Alava, these

fields are remarkably clean of weeds :
whereas around Burgos they are frequently
ablaze with Papaver Rhoeas. # .

A few patches of oaks are still seen
on the slopes . Again a merciless pruning
reduces them to mere stumps . As undergrowth
a low *Genista* ? . Moist spots offer ~~some~~
Thalictrum minus . Limestone offers a yellow
Umbellifer . Fields a small yellow Composite and
rare ~~Valeriana~~ *Valeriana* *Populus nigra* (a few blms)
rare *Valeriana* . *Populus nigra* (a few
blms) still line # the highway

Wepass Victoria and old reclaimed
lake bottoms . I now note some good walnuts
and rare vines ; also a single olive . Sparse
oak woods also occur , with a white *Cistus* (la
laurifolius) as undergrowth . As the train
nears Castillathe dryness is accentuated .

CASTILLE.

Bolling hills , covered by grain fields , many
left to summerfallow . Some apples & walnuts .
Creeks show *Salix repens* & *Populus* .
Roadsides *Populus nigra* . The latter occasional
planted in groves for wood .

Many hills are bare and covered with t
tufts of grass and of a *Genista* ? . Here horses
are pastured . Trees are rare . However
in spots , traces of the ancient forests of
Quercus Ilex "forme" , (see commercial photo)
exist . They are often so cut back that they r
resemble olive groves . Undergrowth has general
ly been cleared out , to get pasture . However in
spots we see extensive live forests with
undergrowth . Thus between Valladolid &
Medina del Campo extensive woods offer a
"Genista" in bloom . All around Valladolid
these open woods of live oak resemble
the region west of Ione , California . There
are also large tracts of *Quercus Ilex*
between Segovia and the lowest flanks
of the Guadarama , with *Lavandula* and *Chamae*
cyparissus . The northern slope of the

upper crest bears conifers. The Guadarama is deforested on the side facing New Castille; brush only testifies to the ancient forest covering.

South of Medina del Campo vast stretches are covered by sands, these bear stands, more or less open, *Pinus Pinea* L. Here again grasses dominate as undergrowth. ^{all} ~~Occasionally~~ however, a graceful pendulous silvery *Genista* or a *Lavandula*. Around the castle off Cora we add *Helichrysum stoechas*. All older trees have been tapped for turpentine. For a while we have bare land, then the hills around Segovia get higher, woods of *Pinus Pinea* reappear, to give place finally to *Quercus ilex*. With it we note *Lavandula* & *Santolina*. At Valladolid cart loads of pine cones are brought in as fuel. In some pine ~~cones~~ forests young pine seedlings are the only undergrowth.

As we near the Guadarama, *Rubus* and *Rosa (canina)* become more abundant. Through out ~~Castile~~ ^{Castile} *Strgium campestre* L., *Cirsium ferox*, *Ferula communis* and (*Anthemis cotula*) Not rare: *Teucrium Mastichiana*, *Echium pustulatum*, *Galium verum* are not rare. In the ~~region~~ ^{Burgos} ~~region~~ ^{region} *Passione perenne* Lamk. Towards the Guadarama a big yellow composite comes in, with common weeds like *Verbascum pulverulatum*, *Echium pustulatum*, *Dianthus* & *Lavandula*.

The following are now numerous: yellow and white composites,

Echium pustulatum

Rosa (canina)!

Cistus laurifolius

Genista, ? (yellow flowered, covers bottoms)

FIELDS of *Sinapis* "(*Erucastrum*, ?)

- *Ferula*

We pass Burgos.

The railroad to Medina del Campo traverses the endless grainfields of the castillian plateau. Moist patches are occasionally grass covered. Vineyards are rare, but found clear to the Guadarama.

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Rare also are Cicer Arietenum, and alfalfa. Towards Salamanca much grain is planted in furrows. A good deal of land lies in summer fallow. On the plain the wheat and barley is ripe. The sickle cuts the sheaves; the grain is ~~winnowed~~ moved by throwing it in the air. I did see two handpower gleaners. Threshing is done by means of a sled (incrusted with small angular pebbles) drawn slowly about by oxen or mules, the driver sitting on the sled. The Guadarama region is colder. On the 11th ~~15~~ July, the grain fields were still green.

IN its bareness this wheat region reminds me of Mexico.

All Castillon towns blend with the surrounding plain, as they are low, dark squatty, and squalid, often of adobe. Only the church, with its conspicuous square tower dominates the landscape. Several villages were formed by cave dwellings.

The tree growth is restricted to some Populus, rare Salix (2 species), sometimes a little Fraxinus or Ulmus. Along the watercourses. Near Valladolid isaw Populus planted for wood. Creeks may show a Ranunculus in the water or Juncus.

In Valladolid the parched plain only has a green patch on the river side. Here oats and alfalfa are common, and we see Elms, almonds, apricots and cherries. In the streets grow Robinia and Cupressus macrocarpa. As a town there is little to see;

The park of Valladolid was invaded by Euphorbia peplis. WE note Pinus (several species) a bunch of Pinus halepensis. Irrigated;

Aesculus hippocastanum
Ligustrum japonicum
Salix babylonica
Morus sp Cedrus sp.
Picea sp.
Abies species several
Sequoia gigantea
Phlox excelsa

Palace Gardens
 Sequoia gigantea (fine specimens)
 Picea excelsa
 Cedrus Betula alba
 Abies Nesculus!
 Fagus sylvatica (folia rubra)
 Sorbus S.
 Sophora japonica ~~lancea~~
 Ulmus
 Tilia
 Walnut!!

The native tree is Quercus pedunculata Ehr. The paths are lined with Aesculus, Acer, Fraxinus, ; but mainly Ulmus. Hedera climbs the trunks. Pteris a rare undergrowth. h. as. spartium, ? (Retama?) is native. In the neighborhood some roads are lined with Populus nigra. The park of the Granja is ^{the} usual Spanish garden, here an imitation of Versailles. The fountains have some fine statuary.

Style.



Squares filled in with

native Quercus pedunculata.



in the sunken gardens, one sees steps of lawn, with shorn hedges very pretty.

Then there is a puzzle garden.

The castle is by no means so rich as the palace of Madrid; but it is cosy enough to be lived in. There are 22 rooms all different, with silk hangings, gilt furniture, beautiful clocks, costly vases, (asiatic) and marble floors. The Salon is a dream, with its wonderful piano; but what captivated my eye, was the dining room. In Infanta Dulalis, I had just lunched and the table ~~was~~ ^{was} banked with yellow roses and greenery. ~~paintings~~ ^{paintings} big hall was a marvel of statuary.

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paintings etc. hidden by potted plants
The was covered by a carpet, 25 feet
square, from the royal factory in Madrid
Although 100 years old it looks like new.

This settings fit for a dozen kings
was all for one person. The rooms look out
upon the gardens and the high peaks. I
can understand the weakness the king shows
for this prize. Here bare hills offer:

Cragtaegus

Senecio Jacobaea L. (common etc.)

Rubus

Verbascum pustulatum

Lotus angustissimus

Plumbago europaea

Jasione perenne Lam.

Moist *Matthias*. *Juncus*

Mentha rotundifolia

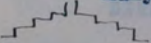
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There were high times in Segovia
the evening. A *Verbena* "was in full swing
and the church bells were accompanying
the pipers. *Moonlight*

In the admired the roman aqueduct,
and dreamt of the past. A youth was singing
"Jotas" as the bells were tolling. Souvenirs
of three periods, Roman, Arab, and Inquisition
Old Rome may outlive them all.

The cathedral is beautiful. It
has the same golden tint as that of Salamanca
and the stone probably comes from the same
beds. This church stands on a hill. The site
of Segovia reminds me of Toledo.

Many old houses are built of


"Fachwerk", with projecting
stories.

A poetic charm lies over the
surrounding villages, their many churches,
and occasional "miradors".

In the market the wasps covered the meat
These pests seem abundant in many parts of
Castile.

SEGOVIA - MEDINA - AVILA

SEGOVIA-MEDINA-AVILA

AUG. 30, 1915

Nearer isolated tufts of *Pinus Pinea* still appear amongst these monotonous grain fields but as we approach the foothills of the Guadarama, scattering *Quercus Ilex* with *Teucrium gaphalodes* Vahl. and more or less *Lavandula* appear. The oak woods gradually become denser, but wheat is grown amongst the trees. With Avila the hills of granite are more rocky and abandoned to the oak. There is a real forest of *Quercus Ilex*, with a *Cistus* as undergrowth. As we penetrate into the Sierra *Quercus Ilex* forests dominate wherever the station is not too rocky or too elevated.

The crest of the Guadarama has a formation of its own, to be studied later.

As we descend to New Castille, *Quercus Ilex* forests dominate again, come in, undergrowth tall *Cistus* (*ladaniferus*?) "Genista" (*Retama sphaeroides*?) *Lavandula*, and in spots dominant *Helichrysum*, *Stoechas*.

Avila! What a typical Spanish, sleepy hollow. Unspoiled by tourists, as is Segovia. Hotel rates are cheap. Immense walls, monasteries, churches, "Teleando la Pava". It was market day, and I had a chance to see the native costumes. It is not a handsome race; but sturdy and faithful.

SIERRA DE GUADARAMA.
(granite)

AVILA-GRANJA. AUGUST 30 1915.

The high mountains still permit *Ficus* and maize to grow. Here potatoes appear. *Robinia* is planted at stations.

On the northern slope of the range *Quercus pedunculata* (with a tall grass as undergrowth) supplants *Quercus Ilex*. Then gradually *Pinus* *Pinus pinea* appears, until the higher crests are forested by it.

They are heavily exploited for turpentine. A big distilling plant and tank cars were passed. The undergrowth is mainly *Cistus* with *Juniperus communis* on sunny slopes. Where bare, there is a stand of *Pteris aquilina* and *Daphne Gnidium*, amongst the boulders. *Fraxinus* is very common, sometimes pure.; often dominant. Minor items are *Juniperus communis* (fine) *Salix* and *Populus*.

Madrid- Segovia

July 7-----&-----August 28/1915

After leaving the scattering stands (finally, only witnesses) of *Quercus Ilex* where only a yellow flowered *Leguminosae* (*Retama sphaeroides*?) is conspicuous, we commence the ascent of the Guadarama. There is a striking difference between fenced and unprotected lands. In general the barrenness and jaggedness of the chain attracts attention.

The north and south slope have a different type of vegetation. As we enter the tunnel at the top, we leave a brush of *Quercus pedunculata* (ravaged by caterpillars) we come in a dense forest of *Pinus sylvestris*. The latter is a localized remnant. Only back of La Granja do we find (on crown lands) a forest of *Quercus pedunculata* below and extensive pine forests on the hills above.

I believe that the lower slopes of the Sierra Guadarama (both sides) above the story of *Quercus* was once entirely covered by *Quercus pedunculata*.

The open brush land of *Q. pedunculata* vocation on the south slope, offered;

- Rubus!
- Teucrium polium*
- Ulex parvifolia*
- "Genista" *Lavandula*
- Helichrysum stoechas*
- Juniperus communis*
- Digitalis purpurea*

The dominant however is *Santolina chamaecyparissus*. The latter disappears at the summit; but is again seen in the lowed reaches near Segovia; but never again so numerous.

Near the crest there is abundant *Pteris aquilina*, both in oak and pine forests. Amongst the pines we noted also *Rosa* and rare *Lavandula* (*pedunculata*??). On adjoining land (bare), *Lavandula* then forms a carpet now in full bloom. This association (cleared land) continues for a long time, with *Thymus mastichiana*, a big grass and a few *Juniperus communis*. Towards Segovia lots of *Jasione perenne* comes in and a yellow flowered composite is common. (with the *Santolina*)

In the mountains, creeks show *Fraxinus* and *Salix*. Wet spots pure *Juncus*. Road sides numerous thistles. The R.R. track has a more xerophytic type of vegetation, in which a *Rumex* (*crispus*?) is conspicuous.

In the open lands of this higher northern slope I note also;

Galium verum
Convolvulus
Echium pustulatum
Lonicera
Dianthus
Umbellifer
Daucus Carrota
Verbascum pulverulentum
Senecio Jacobaea Onon
Ononis (*procurrens*?) *Pteris*
Pteris aquilina
Retama
Cistus

BURGOS

JULY-----NOVEMBER 1916

Excepting Palestine, this region has the most thorough y eradicated native flora I have seen.



it was not always so. Formerly *Fraxinus*, *Salix* and *Populus* lined the water courses. Many indeed are the names ~~of~~ in Castile commencing with *FRES*. IN the valley bottom *Fresdeval*, today only *Crataegus* is abundant.

The vocation of these bare, dry, calcareous hills, is probably *Quercus* *Ilex*; as a few small trees 2 miles north of town would indicate. However all colder, muister slopes and bottoms were once covered with *Quercus* *Tozza*. None whatever remain. These mighty oak forests were cut down a few centuries ago, because they were infested with robbers. Today in parks, around houses, along fields and watercourses one sees trees (especially in the valley of Burgos): but all are planted. The good for nothing *Chopo* (*Populus nigra*) is the dominant feature in the castilian landscape. Its soft wood is utilized by the carpenter, as he has no other; frequently the trunks decay at the base and the winds blow them over.

The Elm is a poor second. It is a bum looker, but certainly of more value than the *Chopo*. The Alamo (*Populus alba*) is sometimes met with. It probably native, as some specimens at Burgos have trunks 6 feet in diameter. A few *Fraxinus* and an *Acer* line the roads near town, but they rare.

In the confines of Burgos many *Aesculus* *Hippocastanum* are planted. Its fruit is carefully collected for the cattle. Then we note, in town, *Robinia* and *Scophora*.

Conifers are rare. Inote *Cupressus sempervirens* and a suffering *Sequoia gigantea*. I was surprised to see *Chaemotrops excelsa* resist the rigors of this climat.

On the hill back of the cathedral they have tried reforestation. *Ulmus*, *Juglans*, *Aesculus*, and *Picea*. However *Robinia* is the only essence that resists the extreme dryness and wind. The entire experiment seems doomed to failure.

Numerous young pines have also been set out, but ^{people} steal them, in order to keep them in pots. IN this country man is a sworn enemy of the tree. Then the ^{people} like to steal. I was told, that in many places here, poultry could not be raised (at least geese and turkeys). This hill was covered with *Hordeum murinum* (earlier, *Papaver Rhoeas*)

The many springs and creeks near town offer abundant *Phragmites communis* Trin. and rare *Salix*.

In the bottoms numerous irrigating ditches keep the soil moist. Here is a dense mat of grass, in which *Trifolium* species and *Bellis perennis* are conspicuous. Sometimes (moist) they are covered with *Mentha rotundifolia* L. IN corners *Sambucus NIGRAL* is in flower. A few apples, pears, prunes, (all good) are seen. Meadows, grainfields and occasional potatoes patches are all green refreshing to the eye after the parched plains to the south. On walls and roofs we see a few *Sedum album* L. *Spartium junceum* grows on the wayside. *Grape* is more abundant. (Late in summer a fleshy perennial with black berries is dominant on roads ?????) ^{Rhus} October ends almost all flowering. Only in protected corners and along stream a few blossoms are left. Up on the hillsides only *Merenderia Bulbocodium* appears.

In July noted;

Aegilops ovata
Brachipodium ramosum Retz.
Bromus maximus Desf.
Festuca ovina L.
Lolium perenne L.
Raphanus Raphanistrum L.
Melilotus neapolitanus Ten.
Medicago falcata L.
Malva parviflora L.
Echium pusillatum Sibth/.
Verbascum pulverulentum Mantago
Plantago lanceolata L.

- Carlina corymbosa L.
Cirsium ferox DC. *Crepis virens*
Crepis virens L.
Hypochaeris radicata L.
Sept. 3
Lycopersicum esculentum DUN.
Solanum Dulcamara L.
Asperula cynanchica L. (dry limestone)
Sept. 9 Nigella gallica Jord.
Rapistrum uliginosum L.
Ononis procurrens Wall. var. vulgaris
Mercurialis tomentosa L. (lime)
Althae officinalis L.
Lythrum Salicaria L. (moist)
Eryngium campestre L.
Echium italicum L. (lime)
- pustulatum Sieb. (sandstone)
Linaria caesia DC.
Scrophularia aquatica L. Verbas
Verbascum Thapsus L. (dry lime)
Nepetella nepetella L. (lime)
Teucrium Scordium L.
Centaurea Calcitrapa L.
Cirsium larvense SCP.
Helichrysum stoeches DC.
Micro lonchus salmanticus DC.
Sept. 17
Merendera Bulbocodium L. (fields)
Polygonum amphibium L. (ditch)
Sept. 25
Galium verum L.
Sept. 25 Juncus glaucus Ehr.
Papaver Rhoeas L. Lotus corniculatus L.
Medicago falcata L. var. media
Ononis procurrens Wallr. var. vulgaris
Trifolium pratensis L.
Daucus Carota L.
Sambucus nigra L. (dominant)
Campanula Rotundifolia L.
Lactuca ramosissima (lime)

- Oct. 5
Potentilla Anserina L.
Epilobium hirsutum L. Veran
VERonica Anagallis L.
Plantago lanceolata L.

Andryala ragusinaL.
 Bellis perennisL.
 Carlina corymbosa L.
 Crepis virens VILL.
 Cirsium ferox DC. Scabiosa
 Scabiosa CCLumbariaL.

Wheat is still the main crop. Barly is also grown as it is more highly valued than oats. All hauling is done by Oxen. I have seen hundreds of carts come into market. The oxen are fed a Vetch "Yerro" (Feris Feri?)

The numerous cold, clear streams of the region furnish the market with abundant Crayfish (basketfull) and trout; caught with scoop nets. I saw them catch a ten pound trout inside town.

Plenty of partridges and rabbits. In September hundreds of smaller birds (thrushes?) were shipped out of town.

This year 1916 there is much misery. A young chap bringing in a load of Ulex (Ulex), for the bake ovens, told me that he received .54 cents (U.S.) for his days' labor. He pays 3 cents town tax, and furnishes his donkey. Poor beast!!

Farm laborers are said to get 20 cents (U.S.) a day. How can they feed their families. When the man is old he must beg. There is great poverty in Spain. The Burgos washerwoman squat along the creek. Its no joke. The water is ice cold, winter brings piercing winds and snow.

PANGORBE (4 1/2 - 1/2 way to Miranda) is an interesting place of which I have an lantern slide.

BURGOS
 BURGOS - SALAS
 July, 11, 1916

Most of the road is lined with Populus nigra. This is also practically the only tree in bottoms: as only a few Salix or Fraxinus are seen in moist places.

We pass rolling limestone hills. Near Salas they form cliffs (Jurassic?). A streak of red at the base may be Buntsandstone. Half way to Salas are the quarries of Burgos cathedral. The stone is hauled by oxcart.

Wherever arable, we have grain fields, rarely apples. All day long isolated Ross. In this quarry region, for the first time, Quercus (Tozza) appears. Soon it ~~forms~~ thickets of stunted brush. Evidently this region was covered by oak forests. This is the testimony also of tradition.

As we near Salas extensive Monte Bajo of Cistus laurifolius L. is seen. This is used as fuel. It is now in full bloom. We note a ~~blue~~ purple tone amongst the white, perhaps a Lavandula. These, Quercus (Tozza) scrub, Cistus laurifolius and the aforesaid purple, are the dominants. Juniperus is incidental. Amongst the annuals a Solidago is conspicuous. In spots Pastinaca sativa L., rarer Verbascum pulverulentum and Petalum pustulatum.

The valley of Salas is almost entirely hay meadows, cut up by irrigation ditches, and surrounded by poplars.

- 1 Agrostis adscendens Lge. (dominant)
- castellana Bss.
- Alopecurus castellanus Bss.
- Bromus patulus Mert.
- Festuca arundinacea Schreb.
- duriuscula L.
- Gaudinia fragilis Beauv.
- Lolium strictum Presl.
- Phleum pratense L.
- Poa trivialis L.
- Ranunculus Steveni Andr. Spär
- 2 Spiraea ulmaria L. Lythrum salicaria
- Lythrum salicaria L.
- Santolina rosmarinifolia L.
- Senecio leucophyllus DC.
- Centaurea pratensis Hoffm.
- Juncus squarrosus Ehr. is dominant in moist places. Another Juncus may occur.
- Lappa minor DC. also.

The showy *Solidago* is common everywhere.

If a turf is formed, it is composed of *Trifolium pratense* L.

repens L.

Bellis perennis L.

On a bridge I collected *Lepidium latifolium* L.

IN the river bed underneath, *Salix purpurea* L. was dominant.

Subordinate:

Salix salicifolia Lamk.

Alnus glutinosa Gaertn.

Saponaria officinalis L.

Lepidium latifolium L.

Lotys tenuis Kit.

Ononis procurrens Wallr. Form *vulgaris*

Vicia lutea L.

Polygonum Bellardii All.

Malva moschata L.

Lythrum Salicaria L.

Epilobium Hirsutum L.

Pastinaca sativa L.

Terilis Helvetica Gmel.

Echium pustulatum Sibth.

Ballota nigra L.

Mentha silvestris L.

Verbena officinalis L.

Scrophularia aquatica L.

Verbascum pulverulentum Vill.

Plantago lanceolata L.

Sambucus nigra L.

Leucanthemum pallens DC.

Santolina chamaecyparissus L.

ROADSIDE.

Abundant:

Sambucus nigra L.

Rare;

Hordeum murinum L.

WALLS/

Hedera Helix L.

Rubia tinctorum L.

Bryonia dioica Jacq.

On the hillsides of course, no irrigation is possible. The vegetation is closely cropped by the stock.

The common yellow Solidago is conspicuous.
ASSOCIATION.

- Agrostis alba L.
- Alopecurus castellanus Bss.
- Cynosurus cristus L.
- Festuca duriuscula L.
- ovinal.
- sp.
- Lolium perenne L.
- Hordeum murinum gl.
- Rumex crispus L.
- Herniaria Hybernonis El. & Sen.!
- Ononis procurrens Wallr. var. mitis
- Trifolium arvense L.
- Erodium cicutarium L.) Herit.
- Nepetq. nepetella
- Verbascum pulverulentum Vill. P
- Plantago carinata L.
- coro nopus L.
- lanceola L.

- Galium verum L. x
- Anthemis Cotula L.
- Crepis virens L.
- Senecio leucophyllus DC
- Thrinacia hispida Roth.

The site is picturesque but the town is dreary. Somehow all these villages have a most dilapidated, miserable appearance. A resident, travelling with me, cried "Old Castille is the most backward region of Spain." "It is still in the middle ages." For this reason precisely, we find "Couleur Local".

A botero was eliminating the taste out of a lot of goat skins, that had served as oil sacks. He blew them up, and smeared them with mud. After drying, this was scraped off. Four times he repeated the process. Then he turned the skins inside out, and repeated the process and tried it once again.

A farmer had his mule tied in front of the cafe. In the saddle bags a dozen young pigs had been stuck. All you could see was their noses sticking out. It was uncomfortable, and the ^{piggies} protested indignantly; for all the good it did them.





Under the eaves of some houses tall sheaves were piled up, probably the straw to be used for braiding. Some hemp was also noted.

The most interesting in these houses is their conical chimneys with board-top.

Around the plaza the second story projects across the sidewalk. The heavy stone wall being supported by pine beams. From the CALABOCCO, were wafted snatches of song, and the thrumming of a guitar. The occupants were having a good time. One of them had his dog with him.

Song, or rather noise, came from the schoolhouse. At recess, all the youngsters came flocking out. Pissing in the street was the most pressing occupation.

Towards evening met 60 older boys. They had been out with their teacher. The marched in rank, and sang.

Pile of dogs in town.

Salas has 1383 inhabitants. I noticed a man spit on his hands, in order to flatten his hair.

It was market day. The main products was wheat. The entire square was filled with sacks. A big discussion arose: the farmer wanted measure, the dealer weight.

Little fruit; but lots of vegetables. Bargaining was intense, a babel of tongues. Cattle rare; but all open spaces occupied by donkeys. Men all in coarse, brown, homespun woollens; many sported new breeches.

It is surprising to see the furrowed, shriveled, hungry, peaked faces. The race is small. The climate is the cause. Theirs is an iron constitution. The eyes are piercing. What a difference between this race, and the tall handsome, lazy, talkative Andalusian.

JULY 11, 1916

ABUNDANT ARE .

▲●●●●

- Agelops ovata L.
Bromus madritensis L.
Holcus lanatus L.
Melica ciliata L.
Scleropa rigida Gris.
Thymus Mastichiana L.
- montana Grantz.
- vulgaris L.
Plantago cynops L.
Galium silvestre Poll.
Achillea millefolium L. ~~Andry~~
Andryala lyrata Pour.
Pieris hieracioides L.
Scattering.
Reseda lutea L.
Lathyrus sativus L.
Euphorbia serrata L.
Guscuta ~~id.~~



Galeopsis angustifolia Ehr.

-Ladanum L.

Phlomis lychnites L.

Siderites hirsuta L.

Teucrium chaemadrys L. *Linaria*

Linaria haensleriana Bois. *Scrophul-*

Scrophularia annua L.

Knautia arvensis Coult. *Centaurea*

Centaurea pratensis

Certain species are common from Salas to Barbadilla. The most abundant is the *Solidago*. In spots *Santolina rosmarinifolia* L.; then we have *Galium verum* L. and *verbascum pulverulentum* Vill. Grasses however, dominate throughout the day we note on wayside

trifolium repens

- *pratensis* D

Daucus

Dipsacus

Anthemis arvensis L.

Leucophaea

Less common

Pastinaca sativa L.

Echium pustulatum

Achillea millefolium L.

Centaurea cyanus L.

From Salas to Barbadilla the vegetation is *Quercus sessiliflora*. I am in doubt about the driest limestone cliffs. Perhaps all has been cut out. Elsewhere we see alternating oaks, forests, scattered oaks, and clearings. As we reach the divide of the two aforesaid watercourses, we pass through a bare Monte Bajo; once a forest of *Quercus sessiliflora*, as the adjoining moist, rich slopes indicate. (Back-ground of photo) Today not a trace of the woods remains; nothing but; Grasses (for 2 species) *Juniperus oxycedrus* L. *Cistus laurifolius* L. *Calluna vulgaris* L.

Prunella

Thymus montanus Chair.

Chair



Open spaces, and all woods, until we get into the highest altitude, always show a dominant undergrowth of *Cistus laurifolius* L.

At Salas I was struck by the beauty of a few specimens of *Leucanthemum pallens*, washed in the river bed. In the higher mountains it forms regular carpets for miles.

A conspicuous feature in the landscape are the bushes of *Rosa*, now in bloom. A pink flowered - *Rosa canina* L., a white flowered *Rosa agrestis* Savi.

CANYON

5(photo)

Quercus sessiliflora
Crataegus
Rosa canina L.
Genista cinerea DC.

7(photo) *Quercus sessiliflora*
(background)

Rosa canina L. (fore ground)
agrestis (Savi) (background)
Leucanthemum pallens Solidago
Solidago

Throughout this higher region *Jasione humilis* Pers. and *Medicago falcata* L. are not rare. Flowers, however, are only abundant in N spots.

Pastures,

Lotus corniculatus L.

Walls, *Rubus*!

Sedum album

Umbilicus pendulinus DC.

Rocks

Sedum brevifolium DC.!

-*elegans* Lg.

Moist canyons,

Lolium perenne L.

Nardus-Lachenali Gdr.

Nardus

Crataegus

Rhamnus cathartica L. }

Prunus spinosa L. }

RARE



The canyons above Barbadillo de Pez
(last place before our destination)
Bromus mollis L. Holcus lanatus L.
Koeleria cristata Pers.
Phleum pratense L. Poa pratensis L.
Hellebous (niger L.)
Thalictrum minus L. Hypericum
Hypericum perforatum Hoffm.
Anthriscus sylvestris Hoffm.
Pastinaca sativa
Brunella vulgaris L.
Galopsis Ladanum L.
Thymus montanus
Melittis melisophyllum L.
Galium silvestre Poll.
Sambucus nigra
Lonicera etrusca L.
Campanula Rapunculosa L.
Achillea millefolium
Andryala Lyrata FOUR.
Crepis virens L.

(Photo village half way Salas -
Barbadillo de Herro)

In these higher reaches, some canyons show a tree that may be Acer. At Salas a few Acer were planted on the wayside. However roads always show Populus nigra (excepting on the highest stretches)

Now, a purling trout stream has cut a deep gorge in the schists.

A ----- Shady north slope -----

Oak scrub, or a brush (more or less open) of Erica cinerea L. At the base, more moisture enables Pteris aquilina to grow in abundance. This is the first time it was seen today. A few Fagus are scattered along the creek.

B ----- SOUTH SLOPES -----
Entirely different ----- Oaks are rarer
(perhaps cut out)

pteris is scarce. Dominant Erica cinerea DC at present in full bloom. A few Sarothamnus scoparius Koch are seen. In rich, moist corners the redflowers of Malva moschata L. attract the eye.

The depression of Barbadoillo de Herberos is too elevated for grain. Fine potatoe patches and hay meadows takes its place. Around houses we still see a few apple and pear trees. The town is old, dirty and dilapidated; but shows local color. (757 inhabitants)

In the PCade a regular dining room, a store and the stable opened on the same hallway. There entire population was here to talk with me. Pigs and dogs roamed at will. One dirty porker, just in from the mud wallows, rubbed his side on my pants. A cur came along and passed on him; but piggy didn't care. Luckily the real dining room was upstairs. The meals were good and clean.

Above the village is an abandoned iron mine. The buildings and abundant water power are now used as a forge and sawmill. The wood (beech) is brought down on horse back from the higher mountains.

An expensive railroad-line has been built from the mainline, to tap the iron, silver and coal mines. (mostly abandoned) of this region. (see lantern slide). For ten years it is idle, the ties have rotted and the tunnels caved in. Crooked work in financing! The railroad certainly could have been utilized, once the track was built.

The mountains look barren, and man has cleared a great deal of land. We note some patches of snow.

The lower range for many miles presents the familiar association of oak sprouts (a few developed trees), Erica equisetifolia and sparse cinerea and sparse Pteris aquilina. Below this story the under-

of the oak scrub, is *Cistus laurifolius* L. a plant that never passes the Erica association line.

On the higher, more inaccessible slopes extensive patches of *Fagus sylvatica* are seen. Sometimes the mangle with pines (ridges!). Several ten mule carts were bringing down immense timbers from Monterubio. In sporadic cases, *Fagus* comes down the canyon, (in shady nooks of northern exposures), to below Barbadillo. Such a grove, almost at the limit of the *Cistus* belt, had a deep swelling, water-soaked carpet of moss. Here I collected:

- Agrostis castillana* Bss.
- Briza media* L.
- minor L.
- Dactylis hispanica* Roth.

- Festuca duriscula*
- Holcus lanatus* L.
- Melica uniflora* Retz;
- Phleum pratense* L.
- Poa plantensis angustifolia* Willd.
- Carex glauca*
- Juncus lamprocarpus* Ehrh.
- Ranunculus Steveni* Andr.
- Primula officinalis* Jacq.
- Astragalus glycyphyllos*
- Primula officinalis* Jacq.
- Ligustrum vulgare* L.
- Brunella vulgaris* L.
- Scrophularia aquatica* L.
- Galium sylvestre* Poll.
- Hieracium vulgatum* Fr.
- Leontodon hispidus*
- Tubusilago Faria* L.

BARBADILLO (around town)

The irrigated fields offered many of the common weeds of the lower region; but here was a good stand of grasses.

- Agrostis alba* L.
- Deschampsia flexuosa* Gris.
- Poa pratensis* L.

Here I collected.

- Cerastium Riae DESV.
- Vicia angustifolia All.
- Calamintha Clinopodium Beth.
- Teucrium Scorodonia L.
- Scrophularia canina L.
- Campanula Rapunculus L.
- Centaurea cyanus *
- Andryala integrifolia L.

Here depressions occasionally show a dense stand of *Heracleum granatense* Boiss.; or a plain blue patch of *Jasione humilis*. Of course *Rosa* and *Rubus* are, not rare. In water *Veronica Beccabunga* and *Mysotis*.

The dryer hillsides, where cleared, are covered with a closely cropped turf, composed of,

- Agrostis alba* L.
- Anthoxanthum aristatum* Bss.
- Avena sulcata* Gay
- Holcus lanatus* L.
- Alnus glutinosa* Gaert.
- Rumex Acetosella* L.
- Trifolium campestre* Schreb.
- *Repens* L.
- Lotus corniculatus* L.
- Plantago carinata* Sch.
- *lanceolata* L.
- Linaria spartea* Link.
- Galium divaricatum* Lamk.
- Verbena officinalis* L.
- Sherardia arvensis* L.
- Campanula lusitanica* L. ~~Andryala~~
- Andryala integrifolia* L.
- Bellis annua* L.
- Crepis virens* L.

Most of the slopes however, have an open stand of brush.

-----SOUTHERN EXPOSURE-----

- (lantern slide Barb. 2)
- Genista candicans* L.
- Jasione humilis*

SHADY HUMILIS

SHADY SLOPES

Quercus sessiliflora scrub.

Staph. arborea L.

Sedum

JULY 13, 1916

SALAS ---QUINTENAR DE LA SIERRA

Quintenar lies on the divide between the Duero and the Alarcon (so the entire day's ride was uphill). The country is rolling (almost a peneplain), there is little fall, and as a consequence the streams are sluggish and meander about through clumps of Juncus, reeds and a few willows.

Two thirds of the way are practically barren; but show scattering brush of Quercus Toza.

with rare,

Juniperus communis Sedum elegans

Sedum elegans Rosa canina

Rosa canina

Crataegus

Genista anglica L.

Cistus laurifolius

Asphodelus

IN SPOTS

Otherwise the plants are the same as at Salas.

Many Grasses!

Lotus corniculatus

Ononis procurrans

Rumex

Daucus Carota

Eryngium arvense

Borrago officinalis

Thymus montanus

Galium verum

Dipsacus Fullonum

---+---+---

(Anthemis)
Achillaea (millefolium)
Bellis perennis
Crepis virens
Scolymus hispanicus
Thistles

-High up -

Rosa Inote,
Rosa agrestis Thalictrum
Thalictrum minus LRhamnus Frangula
Rhamnus Frangula
Digitalis (purpurea)
Scabiosa pyrenaica

Wherever real oak woods have been spared Juniperus communis forms the dominant undergrowth. Really Juniperus forms pure stands by itself.

The last third of the distance, is occupied by pine woods. Pteris aquilina (very rare throughout the day) here becomes common. Scrub oak continues to be the undergrowth. Everywhere, level patches are planted to wheat, rarely oats. Some fields lie fallow.

We were two hours behind time on account of the railroad strike retarding the mail. That didn't hinder us to wait until the veterinary surgeons had along, had visited

in we, a village to see a sick cow. "Gemuthlich". We did not reach Quintenar until 9 o'clock. It is a town of 1,487 inhabitants. The Posada is miserable. Still the bed was miserable clean and the eating good. They served fine trout.

The neighbors are celebrating a wedding, by shooting of fireworks. Tomorrow comes the church ceremony and feast.

In this town the chimneys often occupy the entire room. Splendid as smoke houses for hams; and smoking rooms for men.

JULY 14/5

As we have said, the town lies on the divide between two rivers. A little wheat is seen. All the flats are hay meadows. Water is plentiful.

Abundant.

Ononis (procurrens)

Galium verum

Achillaea (millefolium)

Solidago

A fine walnut was passed.

In the water is *Ranunculus fluitans*

Lamk.

Along the headwaters of the Duera, the dominants are:

Salix salviaefolia Lamk.

- *amygdalina* L.

Rubus

In this creek valley, I note:

Calamagrostis lanceolata Roth

Deschampsia flexuosa

Many other grasses!

Piantus carthusianorum

Gypsophylla officinalis

Sedum brevifolium

Poterium Magnolii Spach

Genista tinctoria L. *Vicia varia*

Vicia varia (Host.)

Rhamnus Frangula L.

Malva (moschata)

Pastinaca sativa L.

Melampyrum cristatum L.

Lonicera

Campanula rotundifolia L.

Jasione perenne

Scabiosa millaefolia

Centaurea pratense Hoffg.

All the surrounding Hills, for miles,

are covered with *Pinus silvestris* L.

The stand is good, but the trees are not large.

Most are young and of equal size

due to a rational exploitation by man.

The clearings bear a sod, heavily pastured.

Dominant are grasses,
Plantago
Trifolium
Bellis

----I NOTE-----

Agrostis alba L.
Aira lendigera
Anthoxanthum aristatum Bss
Briza media L.
Danthonia decumbens DC.
Festuca duriuscula L.
Glyceria fluitans R.BR.
Holcus lanatus L.
Lolium perenne L.
Poa annua L.
- laxa (Haenk.) (to be verified)
Juncus bufonius L.
- glaucus Ehr.

- lamprocarpus Ehr.
Rumex acetosella L.
Arenaria montana L.
Ranunculus Flammula L;
Anthyllis nobilis
Coronilla glauca L.
Genista anglica L.
Trifolium campestre Schreb.
Hypericum humifusum L.
- Perforatum L.
Conopodium degundatum Koch
Erica cinerea L.
Brunella alba Parl.
Mentha pulegium L.

Thymus montanus a
Pedicularis silvatica L.
Plantago coronopus L.
- Lanceolata L.
Galium palustre L.
- rotundifolium L.
- silvestre L.
- verum L.
Jasione montana L. var. hirsuta
Achillaea millefolium L.
Bellis annua L.
Carduus pycnocephalus L.

Filago minima FR.
Hieracium pilosella L.
 AS we near the pine woods, the
 ... *...tatum* Mill.

pretty
 appear
 scrub

of
 an
 Br

Chodat. Publ. Soc. Suisse
 1907

notes for region

Ethemadura

- cistus laadaniferus* L.
- *laurifolius* L.
- *populifolius* L.

Quercus australis
umbellata

- *arbores*
- *ropania*

Cytisus albus Lk.!

beautiful *Retama* type
 with whitish rose flowers

Castinaca sativa
Calamintha clinopodium Bth.
Veronica officinalis L. *Hieracium*
Hieracium Neocerintho
Eyoseris radiata L.

31
Filago minima FR.

Hieracium pilosella L.

AS we near the pine woods, the pretty *Helianthemum guttatum* Mill. appears; and *Pteris aquilina* with *quercus* scrub.

Tozzana

On moist ground, the dense shade of the pines, *Erica cinerea* and *Pteris aquilina* form the undergrowth. *Erica cinerea* and *Pteris aquilina* form the undergrowth.

These three plants *Quercus Tozza*, *Erica cinerea* and *Pteris aquilina*, then form the undergrowth, clear to the upper limit of the pine forest. Higher up, *Erica arborea* comes in, and often dominates in very dry sunny stations. *Pteris* offers the maximum of resistance to moisture and shade. North slopes are carpeted with moss.

Clearings in the pine woods offer some of the beautiful blue *Brunella grandiflora* var. *pyrenaica* G.G. Much more common in fact, dominant in more open spots of the pinewoods is *Vaccinium Myrtillus* L.

-----Moist ground offers:-----

Glyceria distans Wahlenb.

Carex leporina L.

Galium rotundifolium L.

- palustre L.

-----Whilst along creeks grow:-----

Asplenium Filix Femina Bernh.

Elechnum spicant Roth.

-----Incidentals-----

Arenaria montana L.

Ranunculus macrophyllus Desf.

Vicia angustifolia Reich. var.

Polygala vulgaris L.

Viola canina L.

Pastinaca sativa

Calamintha clinopodium Bth.

Veronica officinalis L. *Hieracium*

Hieracium Neocerinthae

Hyoseris radiata L.



As we climb the mountain, the pines gradually lose their uniformity of size and we see some noble trees. Finally a beech or two appear in the creek bed. In cool spots higher up, *Sebes-beeches* mingle with the pines. (photo 6) is a typical pine forest with undergrowth *Pteris* and *Quercus Tozza* sprouts. Photo 7 is taken higher up. here *Pinus sylvestris* (*uncinata*??) and one *Fagus*.

I feel certain that *Pinus* is not the vocation of these mountains. Although cones cover the ground, young pines are rarely found, and then in favored spots. More extensive stands have an artificial look, invariably.

On the contrary, the *Quercus sprouts* spring like a vigorous weed everywhere. High up on the cliffs stood a noble oak tree. The pines claimed the richer soil adjoining.

The vocation is *Quercus Tozza*. In spite of the fact that, as far as I went today, all is a pine forest.

The wedding took place today. The revelers are promenading the streets with and drum, and are the cafe. The two families are rich and will spend 10000 pesetas each.

Already in Barbadillo, a child in the fonda had the whooping cough. Here in the inn a boy is coughing blood. He has had Spinal Meningitis. There are no water closets. How can they expect health? Even if this high pine clad mountain is cold in region

the year round. (Photo 98, chimneys)



-----JULY 15 1916-----
 QUINTENAR DE LA SIERRA-----to-----
 PICO CASTENEA
 PICO CAMPINA
 SIERRA DE NEILA-----

Atevening in Quintenara band of several hundred goats came into town; they had spent the day in the pine forests. Each beast had made an infernal bell and

rumpus as they passed. This morning I met these monsters at the spot that I turned about yesterday. Their favourite browse was the tender leaves of the *Quercus Tozza* sprouts. No wonder that this species cannot develop into a tree.

The path climbs the moist eastern slope. Beyond the limit of yesterday's excursion, *Quercus* gradually disappears. The last stragglers were on the banks of the creek. *Fagus* is present and is vigorous, but soon it also disappears. I should judge that we are at 4000 ft.

From now on there can be no doubt that we are in the home of the pine. All stages of growth are represented, from dense thickets of seedlings to patriarchs a meter in diameter. The vertical extent of this pure pine belt is about 200 metres; but it runs far up on north slopes, in certain gulches. Stragglers even appear nearer the summit.

Calluna vulgaris Salisb. has become rare.

Undergrowth shows abundant
Pteris aquilina *Vaccinium Myrtillus* SL.

Vaccinium Myrtillus L.

Erica arborea

Common *Arenaria montana* L.

Stellaria Holostea L.

Polygala adpressa Wendl.

The creek banks are covered with a cushion of *Sphagnum compactum* Brid. and other mosses, and here a few ferns find root.

Towards the upper limit of this dense pine stand straggles of *Erica cinerea* L. appear. Here also are clearings (probably the axe) covered by *Pteris aquilina* and a few *Erica arborescens*.

Across the gulch (S.W. exposure) a sandy quartzite ridge extends clear down to town. Its flora is totally different, as *Fagus* is absent. Oak brush, however, is abundant; with numerous young pines. On this dry, sunny sand ridge, the pine belt extends further down than on the opposite slope (moist) N.E. exposure, just studied. This had no *Vaccinium*. Here in the upper, *Erica cinerea* L. forms a dense stand; but *Erica arborea* is absent. In the lower reaches however *Erica arborea* takes the place of *E. cinerea*. Here in the upper reaches of this dry ridge there is a violent struggle between pine & oak. I hesitate to say which is the vocation. (In the province of Scoria, *Pinus* undoubtedly replaces *Quercus* in sterile soils.)

We climb further. An open stand of brush replaces the pine forest. It is true, isolated tongues of pines run up the peak; but these are exceptional, and must be studied separately. The story of the brush is dominated by *Erica cinerea*. At the brush is

At the lower edge of this belt *Erica cinerea* is mixed with abundant *Genista tridentata* L., & in spots *Pteris aquilina*. Towards its upper border a few *Erica arborea* are seen. At the upper limit I noticed one *Corytaegus* and a *Juniperus communis*.

The --SCD 44-- of this *Erica cinerea* association is composed of;

Avena bromoides Gouan

Deschampsia flexuosa

Rumex acetosella L. *Arenaria montana*

Arenaria montana L.

Sedum brevifolium DC.!

6- *dasyphyllum* L.

Potentilla procumbens Sibth.
Lotus corniculatus L.
Vicia sativa L.
Polygala depressa Wendl. V
Viola Bubani Timb.
Calamintha acinos Jörd. *Thymus*
Thaus-
Thymus montanus
Melampyrum silvaticum L. *Galium* si
Galium silvaticum L.
 - *Vernum* Boer.
Bellis perennis L.
Hieracium serpyllifolium Fries!

A gully running to with-
 in a few hundreds yards of the
 summit, shelters one of the tongues of the

pine association. In the lower reaches
 some of the *Pinus silvestris* shows
 trunks a meter in diameter in diameter
 This entire depression had an abundance
 of *Vaccinium myrtillus* L. (probably an
 indicator of moisture) In the moister
 lower stretches a great deal of *Erica*
arborea mingles with the *Erica cinerea*
 -(plant of dryer ridges) Of course, also
 more or less of the above list come in.

As we attain the uppermost reach-
 es of the moist depression, the pines
 are gone, the two *Ericas* and *Vaccinium*
 peter out, and a dense carpet of *Callun*
a vulgaris Salzb. covers the ground.

Pteris had been seen amongst the pines
 but is now totally absent. *Arenaria mon-*
tana is the only annual.

With the exception of these pine
 streaks, the *Erica cinerea* association is
 only interrupted by outliers of the bare s
 sod, of the summit association. there
 is in fact no clearly marked limit between
 the two groups. Edaphic conditions, perhaps,
 conditions, or perhaps, a difference in
 the length of the snow covering, allows
Erica to come up higher in spots.

Dryer streaks, almost to the top
offer *Erica Tetralix* var. *glandulosa* L.
- *cinerea*
- *arborea*

Prolonged snow covering means a
almost pure patches of sod. Masses of an
unnow are still found. Here the moist gro-
snow

und shows about mosses.

The dense mat, on deeper soil
is composed of;

Anthoxanthum aristatum Bss.
Festuca indigesta Bss
Gaudinia fragilis Beauv.
Hardus stricta L.
Arenaria montana L.
Paronychia polygonifolia DC
Sedum brevifolium DC. - (rare) *Lotus*
Lotus corniculatus L. (very rare)
Brunella vulgaris
Thymus montana
Melampyrum sylvaticum L.
Galium verum Scop.
Saxatile (rare)
Hieracium pumilum Lap.

Around SPRINGS, we add:

Juncus squarrosus L. *Luzula*
Luzula campestris DC.
Viola canina L.
Veronica serpyllifolia L.

Many spots however are
absolutely bare, with only isolated such
ions of;

Festuca ovina L.
Poa bulbosa L.
Alsina recurva Wulk. *Arenaria*
Arenaria montana (rare)
Scleranthus Polycnemoides Willk.
Sedum brevifolium DC.
Lotus corniculatus L. (rare)
Plantago carinata Schrad. (lower
down)

These two variations of
the mountain sod blend into each other.

37
The top of the peak (Campina)
is composed of the cushions.

Festuca indigesta Bss.

Alsina recurva Wahl. *Hieracium* ser

Hieracium serpyllium folium

Leontodon hispidus L.

A series of cliffs forms the
north rim of the mountain (silica). The
cracks are filled with:

Aelosurus crispus L. (rare on the
southern slope)

Alsine recurva Wahl.

Saxifraga Hypnoides L.

To the north, below us, encircled
by a sod of grass, lies a lake. Some plant
(algae or Lemna) tints it a bright green.
Bare peaks extend on the northern horizon.
(Sierra Demanda) probably all covered with
the same sod we are treading.

All gulches are wooded with pines.
Isolated patches of the same trees seem
to testify that once all these upper forest
were pine forests.

Looking towards Soria (S.E.) the hills
are lower, and for many miles, ~~are~~ with
pine forests. A few woods are seen to the
south of us; but to the west all is bare.

These elevated meadows offer past-
ure to many animals. The poor beasts must suf-
fer awfully. I have never seen such a lot
of vicious flies-- flies. They appear in
every conceivable shape and size. Some
with green eyes; others with black or bro-
wn. Some of these insects are an inch long.
All are bloodsuckers! When I sat down,
my clothes were covered with them. Later
on, I have seen their marks on all donkeys
and mules. In Aranda every animal had its
hide streaked with blood. However--

Horses are said to be less subject to
attack. However the stock of our stages
were all stung; in pine woods. I did not

notice so many pests. On these upper meadows, their number and variety is appalling.

Going down to town I met women and girls bringing in the hay for the winter's supply. The female, here, is the beast of burden. The schoolmaster in Quintenar gets 25 cents (U.S.) a day salary. Half what a farm hand commands.

In this region I collected two pines. I am in doubt as to their ~~rank~~ relative distribution, as my notes are not clear. The common tree of the lower Hills (younger) are certainly *Pinus sylvestris*. I also found it on the highest flanks, but *Pinus uncinata* also was collected (I suspect that it grows in the middle altitude, possibly where the first big trees (natural stand) appear. This species has certainly not been planted.

66----- QUINTENAR TO SORLAC-----

We traverse miles of pine forest. Almost all the way we pass heavily loaded oxen bringing sawn timbers to the railroad. Oxen are common, but usually mules are employed, hitched in single file. It seems cruel to see these poor oxen bending under the projecting planks. The mill men are making fortunes, for the first time. As American and Swedish lumber is cut off, Barcelona etc. must come here for its supply.

These forest belongs to the villages; but the government exercises supervision and collects 10 % of the product sold. The mills are driven by overshot waterwheels.

At first *Quercus Tozza* scrub is still abundant but as we approach the headwaters of the Duero, great stretches have no undergrowth. Here then young pines of all ages abound. Hence it is possible that large areas may have *Pinus*

as vocation. However isolated oak sprouts occur, even here. (On the slopes of Alarcon Quercus is the still the vocation. The soil is poor and dry. A hard quartzite like sandstone. Perhaps it is this that shuts out the oak.

With headwaters of the Duero the forests are more open and show grasses, *Erica arborea* and a sod of grasses; also,

Aalsine recurva Wallr. (rare)

Sedum brevifolium

Melampyrum silvaticum

Hieracium pumilum Lap.

Leontodon hispidus L.

Now the streambeds widen out and form pretty valleys with irrigated meadows.

I note;

Grasses;

Potentilla procumbens

Trifolium pratense

repens

Brunella vulgaris

(*Thymus montanus*)

Campanula Rapunculul.

rotundifolia L.

Bellis perennis

A AGæ

A "Genista" creeps in, and *Juncus* and *Salix salvifolia* Lamk. line the water-courses. On the wayside we see the usual weeds, *Solidago*, *Centaurea*, *Galium verum*, *Crataegus* and *Rosa*.

Each town has its big wall for the "Pelota". Storks nests on the church tower;.

Throughout these hills the women carry the water on their shoulders. For the first time, at Numantia, I saw an old woman carrying the jug on the head.

We follow the course of the Duero. Now the hills are lower; less fall; the waters are deep and sluggish. They show abundant central European aquatic plants.

In riffles a *Ranunculus*, *Populus* and *Salix* line the banks. I also noted the white trunks of two *Betula verrucosa* Ehr.;

Now pine forests and wet meadows alternate. For several miles the vocation had been Pinus. This now ceases, as Quercus Tozza henceforth (clear to the end of the pine district) forms carpets; and is surly the vocation n Pteris, Erica, and rare Genista appear.

On the northern slopes of the highest reaches, the pale green of the Quercus foliage mingles with the dark of the pine. Here a few dozen tender green tufts were probably Fagus.

The hills pass to the plains; the pines become sparse; and the oaks are more numerous, now some are fine trees. From Vinue(s) - a to Soria all these rolling hills were once clothed with Quercus with Quercus Tozza. All is now cleared. The remnants are miserable indeed.

At the limit of the pine forest, far the first time, since Quintenar is a grain field but still potatoes. On the roadside.

- Grasses
- Sedum brevifolium (walls)
- Crataegus
- Rosa
- Rhamnus Frangula
- Malva moschata (moist)
- Erica
- Erica arborea
- Digitalis
- Digitalis Purpurea (moist)
- Verbascum pulverulentum
- Galium verum
- Dipsacus

Occasional Juniperus communis and once abundant Calluna vulgaris were seen.

However there is already a penetration of the plants of the warmer lowlands; namely Andropogon, Asphodelus, and Cirsium ferox. Or again a patch of Lavandula, Genista Scorpius, and another "Genista". A pond, lined with Juncus, was filled with Nuphar.

The country becomes dry and bare. Sideritis pungens Benth. is abundant. THEN

41
again lots *Genista scorpius*! We pass miles of oak scrub : occasionally an oak tree one had a trunk 4feet in diameter.

Now for the first time ,a big rough -leaved *Cistus* appears (sp.?) Throughout New Castille, *Carduus nigrescens* Old

Vill. is abundant. We note *Scolymus* and *Sedum album*, *Echium pustulatum*.

Populus alba lines the wayside ,rare ly *Ulmus*.

Here the grain fields are a till green., whilst at at Soria they were harvesting.

South of us extends a limestone ridge like the cliffs (Jurassic?) Grasses dominate . Once, there was a pure strand of *Crataegus* and *Quercus* (*sessiliflora*)

-----JULY 16 1916.-----

-----SORIA-----TO NUMANTIA-----

Almost all the land is planted to grain. *Ulmus* and *Populus* line the road. IN the distance, a single hill still showed oak scrub . w THE landscape is now one of ancient cultivation, in which the poplars and the willows of the Duero constitute the only tree growth . On the horizon we see the dark streak of oak scrub we passed yesterday. On silica grows abundant *Genista scorpius* DC., and *Thymus Mastichiana*. All limestone hill offered as admin ants;

Dactylis hispanica
Sideritis pungens Benth.
Thymus *Oxyodonthus* S. & Pau
- *Mastichiana* L.
Phlomis *Lychnitis* L. (rare)
Plantago cynops L.
Artemisia Assoana Wk.
Ch

Santolina chamaecyparissus

On roadsides ;

Stipa gigantea Lk.

Crataegus

Rosa

Medicago falcata L.

Ononis (procurrens?)

Sideritis pungens Benth.!!!

Thymus vulgaris L.

Echium pustulatum Sib. *Carduus nigres-*

Carduus nigrescens Sib.

Sentolina chamaecyparissus

-----NUMANTIA-----

The old Celtic city lies on the hill on the north bank of the Duero. Here are several monuments to the memory of Iberian heroes. Many excavations have been made and they are still at work.

Only the foundations remain. Squares, outlined by simple lines of stones, indicate the ancient metropolis. One street, in a circle, surrounds the city. From this the streets radiate towards the center. Each one of these laterals had a gate.

All these little rooms had the most angular shapes imaginable. A fine collection of the antiquities found here are preserved in the museum of Soria. Rich and interesting! We see enameled jewelry of bronze and silver, trinkets, tools, bits, spurs, and weapons; and the most curious giant iron keys bent at right angles, with pointed handles. If these articles are really Iberian, they testify to a high civilization. As the bulk of the museum, however, is composed of Roman pottery, needles etc., I have strong doubts whether articles are not Roman (possibly imported from Greece or Phoenicia). The glassware was certainly blown at Tyrrhus.

Numerous small burnt-clay idols of hideous shape and childish workmanship may just as well be the product of Roman hands. The articles of deerhorn (carved), the

iron lances and knives and bronze dagger scabbards as well as the hundreds of eggshaped shot projectiles are unquestionably Iberian. I believe the same of a burnt fabrique, made of Esparto fiber. Numerous disks to grind grain may be either Roman or Iberian; probably the latter.

Altogether Numantia is a most interesting place, its strategic position for those days was of the first order. The beautiful stream (Duerro) at the foot of the hill, offers water in abundance. Numerous wells in the houses would indicate reserves for times of siege. The streets were all paved and had big blocks at regular intervals, as if to bar carts. A vast plain extends around the city. In the distance one sees mountains, with patches of snow. Up to the very limits of the ruin, grain is now grown. These plowed Terraces hide many secrets.

With the exception of *Gratagosa*, only annuals were seen.

Agrostis alba L. *Aegilops ovata* L.

Aegilops ovata L.

Dactylis hispanica

Festuca arundinacea Schreb.

- *indigesta*

- *ovina* L.

Hordeum murinum Stipa

Stipa gigantea Lk.

Papaver Argemone L.

- *Rhoeo*

- *somniferum* L.

Erucastrum subpatifidum Lang.

Reseda Gayana Bss.

Medicago falcata

Ononis (procurrens) *Vicia tenuifolia*

Vicia tenuifolia Retz.

Helianthemum pilosum Pers. var. *tomentellum*

Daucus Carota

Eryngium (caespitose)

Echium pustulatum

Phlomis Herba Venti L.

- *L. chnites*

Salvia aethiopis L.
Thymus Oxyodonthus Sem. et Pau
- vulgaris
Kohlrauschia prolifera Kth.
Galium verum
Knautia arvensis
Achillea Millefolium A
Anthemis Cotula
Carduus nigrescens Vill.
Centaurea Cyanus L.
Cichorium intybus
Cirsium arvense Scop. C
- ferox DC.

Crepis vireas
Hieracium pilosella (a dominant sod)
Leucanthemum pallens DC.
Microlophus salmanticus DC. S.
Santolina chamaecyparissus Scolymus h.
Scolymus hispanicus Tragopo
Tragopogon porrifolium L.

Soria is an interesting
Classic old town. Some of the public buildings
s are in the massif rich style of Salamanca
with many carvings, coats of arms, curious balc
onies and iron work. The stone has the
same rich golden color seen in Salamanca
(possibly from the same beds). There is
a fine old romanesque church. In the neighbor
hood we find many old monasteries, her
mitages and churches.

Past grandeur! Some of the finest
of these noblemans' palaces are now store-
rooms, others have the roof caved in. The
spirit of decay hovers over all; . Miserable,
dilapidated entrances. Still it is typically
spanish, unspoilt by the tourist.

Martial law has been proclaimed on acc
account of the strikes. Military reserves
patrols are called out and the Guardia Civil is pe
have been called in and the Guardia Civil
is patrolling all roads. Newspapers now
have blanks as if it were in France. Soria is
the terminus of the railroad and from here
a dozen diligences leave for the interior.



-----SORIA-----to-----ARANDA-----

July 18, 1916

I had to change cars at Gusecurite. It meant 8 hours wait, for the train branch line. If I had known I could have stopped near by at Almansara most beautiful little city, lying on the Duerro. From here a buss would have taken me to the train. Many church towers & an old moorish town wall, promised local color. As it was I stopped in the most abominable, poverty stricken little place I have seen in Spain.

All houses were of adobe. It is surrounded by a dreary plain of wheat fields. I was surprised to see a Canadian made harvester.

In the creek were lots of Salix babylonica.

It is a noticeable fact that throughout the Duerro valley, all places show a marked moorish influence. This is particularly noticeable at Aranda. The entire city being of hachwork and adobe. At Soria Soria it is the massive stone palace; the Duerro valley has none of these fine structures. It is the same influence, shoddy and sham, we feel at Toledo and Damascus. It is arabian.

Only the church at Aranda is an exception. A fine specimen of the earliest gothic, with carvings. Finished the arabs there before the Arabs came.

There is also a pronounced strain of arabian blood here. Less so in Soria. But even in Aranda, the iberian (celtic) influence influences, perhaps, the dominant. Blonds are many. Possibly it may be an inheritance of the Goth. However undoubtedly celtic are the eyes, and, until proof of the contrary, I declare these blonds to be the same. Handsome are rare. In spite of undersize and poor nourishment, health, strenght and vigour wiryness seem to be a patrimony of the region. Strangers are rare. My presence is an event. Aranda is a town of arcades (photo)

Nothing pretty about it. Dreary place. In the were threshing.



46
The railroad strike, fills trains and stations with Guardias Civiles. They eyed me with suspicion. Apparently I have something about me that awakens interest, mistrust.

ON the road (diligence) from Aranda to Burgos, we were overtaken by an automobile full of Guardia civiles. a quarter of an hour later, passed a beautiful roadster automobile conducted by a young chap with a lady along side, and the chauffeur sitting very attentive behind. Soon another automobile passed. Then another with Guardias Civiles. They we heard that Later on we heard that it was the king and queen. To bad that I didnt examine him closer. He looks awful earnest and bored. Poor man! Noblesse oblige.!

At the village Gumiel, boys tore out hairs from our horses tails, while the driver was not looking. Cruel devils! They make nooses to catch partridges. The Gumiel citizens are said to be the meanest crowd in Castille. They are always stabbing or shooting each other.

A big thunderstorm passed over the region; women and several men were killed. In writing this, at Burgos, (21) heavy black clouds threaten and lightning may burst forth at any time.

----- BOTANY -----

Directly we leave Soria, we cross a limestone region, which a range to the south west.

forms

The latter is covered with Quercus Ilex. The live oak is also seen in the Duerro valley west of Almansor.

Otherwise, in the entire region, from Soria to Cuscurita, Quercus (sessilis) is the only oak. The dominant, however, as to forest, is Pinus (sylvestris). In this stretch, on all soils, Thymus Mastichiana is the most common plant.

On the aforesaid limestone patch, at the beginning;

DOMINANT.

Stipa gigantea
Genista Scorpius DC.
Lavandula stoechas
Thymus Mastichiana Sideritis
Sideritis pungens Benth.

Some

Leucanthemum Pallens

Most of the region is silice level or rolling.

Lavandula stoechas is seen in spots, sometimes different abundant.

To the extent forests of low *Quercus* (sessiliflora).

All day *Santolina chamaecyparissus* and *Plantago cynops* are abundant.

To

A yellow *Ononis* and *Daucus Carota* are common. *Jasione* (perennis) in spots; but the common *Dipsacus*, *Solidago*, *Galium verum* are now rare. *Papaver Rhoeas* forms a purple Patches in the fields. *Robinia pseudo acacia* is in bloom.

With the level ground we pass miles of barren sand, growing an autochthon stand of *Pinus sylvestris*. A dense growth of young pines, of all ages is springing up. Most of the older trees are heavily cut for turpentine.

As undergrowth of pine forests;

Juniperus (xycedrus) rarer
Erucastrum - (subpinatifidum) track
Crataegus rare
Geista Scorpius
Cistus (laurifolius)

Erica arborea (rarer) *Lavandula stoechas*
Lavandula stoechas rarer
Phlomis Herba Ventae (common plain)
Sideritis pungens
Thymus Mastichiana
 t - (vulgaris)
Scolymus hispanicus (on track)

From Cuscurita we descend the Duerro valley. At first, to the north, we see extensive forests of *Quercus* (*sessiliflora*). As we have seen, on the northern bank there is an outlier of *Quercus* *illex*. Live oak woods are also seen south of Reco. The *Quercus* (*sessiliflora*) woods to the south are sometimes mixed with *Pinus*. South of Reco I also note *Juniperus thurifera* L.

Most of this rolling land, however, is now planted to wheat; with a few vines. Where not cultivated *Genista Scorpius* and *Thymus Mastichiana* dominate.

Pure sands are always occupied by *Pinus* (*Silvestris*).

- Undergrowth ;
- Cistus* (*laurifolius*)
- Thymus Mastichiana*
- Sideritis pungens*

An extensive forest of *Pinus* is seen to the north of Barlanga. *Quercus illex* is now abundant. Creeks are lined with *Populus*. In the neighborhood of Barlanga many miles are covered with a forest of *Juniperus Thurifera* L. with trees from 18 inches to 1 meter in diameter. A few *Quercus illex* may occur. Then this pure stand alternates with mixed woods of *Juniperus*, *Quercus illex* and *Pinus* (*Silvestris*). Bare spots show the above undergrowth, with a tall grass (perhaps *Glyceria distans*). *Cistus* is rarer. Now vineyards are common. Irrigation at Osuna brings beets and a sugar factory. Wheat and vines alternate. At the last station before Aranda, the mixed stand of *Juniperus* and *Pinus* reappears. Weeds are those seen at Soria; but *Verbascum* and *Solidago* are wanting; and all the way from Soria to Aranda, *Galium verum* is rare.

At the flora
At Aranda the flora is poor.

49

Here, in most creek bottoms "Solidago" again appears. The moist pastures where it mainly formed of *Trifolium repens*.

-----July 20, 1916-----

-----Aranda to Burgos-----

Now for many miles the vegetation is *Quercus ilex* as indicated by scrub growth amongst the wheat fields. The entire region is a plain of soft, tertiary limestone in which erosion has cut out a series of valleys. Each depression has a village, surrounded by wheat fields. Poplar marks the creeks.

As a roadside tree *Populus nigra* dominates. North of Lerma are some fine Walnuts, and a few Acer. Near Burgos are Elms.

Dominant is *Thymus mastichiana*. Gradually, as we approach Burgos, a pale-flowered *Lavandula* becomes abundant, an important factor is a green, juicy, yellow flowered plant, creeping about. I do not know it. I saw one single *Asphodelus*.

(*Glyceria distans*)

Stipa gigantea

Roseda lutea

Crataegus

Potentilla

Rosa (rare)

Rubus

Medicago falcata

Ononis (*Procurrens*)

Euphorbia serrata (rare)

Cistus Laurifolius (rare)

Eryngium campestre

Phlomis lychnitidis

-Herbs Venti

Salvia aethiops

Thymus vulgaris!

Echium pustulatum

Plantago cynops

Galium verum 5 very rare

carduus
Cichorium Intybus
Microlophus salmanticus

Pastures offered;

Grasses
Lotus corniculatus
Trifolium repens
- Pratense
Achillea Millefolium

Anthemis Cotula
Hieracium Pilosella

AT Lerma (2627 inhabitants)

Juniperus thurifera

- (Oxycedrus?)

Genista scorpius!

Lavandula Sideritis pungens

Sideritis pungens!

Just after Lerma, a single Quercus sessiliflora fore shadows the forests of white oaks that gradually take the place of Quercus Ilex as we near Burgos. White Morhanunquena sessiliflora, grasses, become Quercus

more numerous, but Genista Scorpius is still abundant. Then the ~~Papa~~ poplars of the bottoms attain enormous size.

From the Duero valley to Burgos agricultural machinery is more abundant than any part of Spain that I have seen. Still 95% of the harvest is cut by sickle. Much land is subject to summer fallow.

Seventeen miles ~~from~~ from Aranda is a Yankee farmer who has spent hundreds of thousands of dollars on agricultural machinery; he works rented land, on a thirty year's lease. He has 60 mules. This man married his shepherd's daughter, whom he had previously sent to boarding schools. Quite a romance!

-----JULY. 22. 1916-----

BURGOS. TO BELORADO.

SAN DOMINGO CALLEADOHARO.

for miles the highway follows the valley of the Alarzon. The horses trot along, and the driver reads the newspaper; with hills commences the customary beating, yelling and general cursing.

The usual *Populus* and scattered *Salix* fill the wet bottoms. On the Ebro watershed *Populus alba* L. and *Salix* form the gallery fringe. Moist, deep soil has abundant *Sambucus nigra*. This disappears with the Oca mountains; is again abundant at Vilafranca, and Belorado, on the Ebro watershed, but is not present in the Ebro valley.

Medicago falcata is not rare, and some sainfoin is grown, also a little oats; but the crop is wheat. Potatoes are abundant and go up high into mountains. At Belorado, then, we see bean fields. With the exception of the Ebro valley an occasional noble walnut is seen, also a few splendid *Aesculus hippocastanum*. we note apples, pears, and, in the mountain valleys, plums.

Near Burgos, in moist ground, on the roadside, *Salix* replaces the usual *Populus nigra*. One of these willows was covered by mistletoe. *Platanus* is rare; but beyond Belorado the avenues were of *Populus alba*.

The coolest mountain road was lined with *Fraxinus* and *Acer*.

We may divide the region we passed today into 3 sectors.

1. (a) Burgos--Mts. of Oca.
(b) North base, Mts. Oca, to beyond Belorado, to approach of Ebro Valley.

3

2 MTS. OCA.

3 Dry region

beyond Belorado, blending into the warm district of the Ebro.

REGION NO. 1

common,

Grasses

*Rosa canina**Cnoris (procurens)**Trifolium Pratense*

- repens

*Daucus carota**Eryngium campestre**Convolvulus lineatus**Echium pustulatum**Verbascum pulverulentum**Galium verum**Dipsacus (fullonum)**Anthemis Otula**Centaurea Scabiosa L.**Crepis taraxacifolia Thull.*

Thistles

*Scolymus (rare)*As we reach the base of the mountains
(both sides)*Brucastrium subpinatifidum**Roseda Gayana**Crataegus**Potentilla procumbens**Rubus**Rhamnus cathartica**Malva moschata**Borragia officinalis**Thymus montanus**Ligusticum Pyrenaicum? Goum?**Lonizera**Bellis perennis**Leucanthemum pallens*In village streets *Hord*
eum murinum and *Bromus maximus*.The region of Belorado is
much richer than the Burgos plain. I here note
the in addition:*Oxalis**Poterium**Rosa canina*- *agrestis**Lychnis**Mentha sylvestris*

Fields are red with-- Papaver
Rheas, and Centaurea cymosa is not rare, especially in the upper region.

The vocation of the entire district from Burgos to Haro is that of Quercus sessiliflora.

With the hills a few oak sprouts appear and isolated trees. These are followed by miles of oak scrub, passing into open oak woods in the more distant mountains. The soil is silica. However at the beginning of the hills, a ridge of hard limestone comes from the north west. Here Quercus ilex has found an island of refuge, in the sea of white oaks; and it was the only spot that I note Euphorbia characias.

The grain is being harvested on the plain, but in these hills it is still green. In the highest patches it will not ripen until autumn. Also, the flowers show a much greater vigor, owing to the moisture and coolness. Many mountain slopes offer a dense carpet of blossoms. Leucanthemum pallens, rare below, is abundant everywhere. Some are white with Daucus Carota or pink with Brunella alba Pallacsy. With the hills Genista scorpius reappears, but seeks dry bare slopes.

-----MONTES DE OCA-----

The cut out forest of oak, has as dominant Erica cinerea L. and scattering Thymus montanus. Thymus cinerascens is now in v bloom, and for many miles the hillsides seem daubed with crimson. Beautiful! These two red flowers, alternate or mix; higher up Erica arborea also is abundant, but its flowers are passed.

The highest ridges show pure Erica cinerea on the south exposures, and with-- Erica arborea on the north. All with Quercus sessiliflora scrub.

Here in the plateau region, all of a

first
sudden, and for the time, we come across a patch of *Pteris aquilina*, or rather a mingling of this fern and *Erica cinerea*. From now on *Pteris* & *Erica* mingle or alternate. With them are some *Helianthemum* and *Juniperus communis*.

The sod of the Mts. de Oca shows nothing exceptional. Lower elevations have pure *Plantago cynops*. Soon however *Plantago lanceolata* appears and

- Agrostis castillana* Bss.
- Danthonia procumbens* DC.
- Poa*
- Ratexilla procumbens*
- Rumex*
- Lotus corniculatus*
- Trifolium pratense*
- Repens*
- Brunella alba*
- Galium rivulare* Bss.
- Achilla millefolium*
- Crepis virens*
- Hieracium pilosella*

In the brush;

- Asphodelus* (a stem-single stem)
- Ranunculus* (moist bottom)
- Craetagus*
- Rubus* !
- Delphinium*
- Roseda Gayana*
- Rosa canina*
- Genista sagittata* L/.
- Rhamnus cathartica*
- Hypericum perforatum*
- Erythra pulchella* Horn.
- Lavandula latifolia*
- Salvia* (aethiops)
- Sambucus nigra*
- Microlophus salmanticus*

At the base of a mountain, near a village, *Syringa vulgaris* was in bloom, with *Lepidium latifolium* L. and *Tussilago farfara*.

HARO (Provincia Logrono)

July 23. 1916

Interesting old town. Fine seigneurial mansions, residences, falling into decay. The striking church tower, is similar to that of Santo Domingo seen yesterday. The tower and the vaulted walls, seem a fortress on the hill top. The location is picturesque. The people look sickly.

The great industry is wine. Vineyards extend to the city limits. Many big wineries, that buy their grapes. The industry is said to be a shadow of what it used to be. Soil is a deep loam formed by a soft, disintegrated limestone. The best vineyards are a few miles up stream on limestone bottoms. A load of fuel showed, Juniperus Oxycedrus and Quercus ilex.

SANDSTONE HILLS.

- Brachypodium ramosum R. & S. (Dominant)
 - Dactylis hispanica Roth
 - Koeleria setaria
 - Asperula cynanchica L.
 - Erucastrum pollichi Spreng. (Pollichi)
 - Sedum album L.
 - Ononis columnae ALL.
 - Arestaph
 - Arctostaphylos Uva Ursi Spr.
 - Erythraea pulchella Horn.
 - Convolvulus lineatus L.
 - Salvia verbenacea L. T
 - Thymus vulgaris L. / (dominant)
 - Plantago lanceolata L.
 - Scabiosa maritima Artemisia
 - Artemisia Herba alba
 - Hieracium pilosella L.
 - Santolina chamaecyparissus
 - Thrinchia hirta Roth.
- Moist northern slope (same hill)
- Bromus mollis
 - Sinapis incana L.
 - Genista scorpius
 - Trifolium pratense
 - Torilis helvetica Gmel.



Corr

Convolvulus arvensis L.
Plantago cynops
 " lanceolata
Scabiosa maritima
Artemisia herba alba
Centaurea Calcitrapa
Cirsium forex
Crepis ~~patula~~ folia
 taraxacifolia Thuil. Hirt.
Hieracium pilosella

ROADSIDE: Raphanus Raphanistrum
Medicago falcata
Convolvulus lineatus
Galium verum Cichorium
Cichorium intybus

The Mediterranean influence follows
up the Ebro valley. All roadsides here lin-
ed with *Lycium europaeum* L.

In park ;

Abies
Thuja
Eucalyptus gigantea (5 feet at base)
Platanus (avenues)
Aesculus
Tilia

Threshing is some done by sled

but generally by three carts tied behind
each other and driven around at a trot.

A little creek;

Populus
Rubus
Malva moschata
Tamarix
Scrophularia (big)
Verbascum pulverulentum
Sambucus nigra
Solidago
Santolina chamaecyparissus

Higher up on the banks we saw the
see

same plants as on the hillsides studied;
but along the ditch the vegetation is
much richer:

Herodaeum murdanum
Urtica
Trifolium (pratense)
Geranium pyrenaicum L.
Torilis helvetica
Convolvulus Linestus
Mentha rotundifolia
 -silvestris

Crepis taraxacifolia
Microclonchus salmanticus
 The broad gravels of the Ebro
Populus nigra L.
Althaea officinalis
Daucus Carota
Convolvulus arvensis L.
Thymus Mastichiana!
Plantago cynops
Chondrilla juncea
Santolina rosmarinifolia H.!

CN ditch;

Rubus
Eryngium campestre
Convolvulus sepium L.
Bryonia dioica Jacq.
Microclonchus salmanticus
Cirsium ferox

JULY 23rd, 1916

--- HARC TO MIRANDA DE EBRO ---

I traveled second class. Children p
 pissed all over the floor.
 We passed much limestone and
 gypsum.

Fine walnuts

Ulmus

Figs

RIVER.

Populus

Harc. --- Vineyards (some on wires)

MIRANDA.

Sugar beets, some maize.

Limestone hills;

Quercus Ilex
Genista scorpius
Cistus (albidus). (?)
Scolymus hispanicus!
Santolina chamaecyparissus

Roadside

"Solidago"

Thy garrigue of these hills is composed:

Pteris aquilina (flats) bx
Buxus sempervirens
Daphne Gnidium L.
Erica arborea
Lavandula
Thymus vulgaris!

-----MIRANDA TO BURGOS-----

The track as far as Montes de Oca traverses a limestone region. The trees have been cut out, but the vocation is Quercus Ilex.

Dominant:

Quercus coccifera
Genista scorpius!
Buxus sempervirens
Lavandula latifolia Vill.

Subordinate.

Psoralea?
(Sideritis runcgens?)
Campanula (Rapunulus)
\$Anthemis-Cotula)

Near Montes de Oca, a bare hill showed:

Thymus Mastichiana
Santolina Chamaecyparissus
Phlomis Herba ventil. is common on roadsides etc. Moist spots offer Ligusticum pyrenaicum Gouan. Bottoms show Daucus, Chlora, Phrythraea. Near the mountains Erica cinerea and Medicago falcata.

Now an occasional *Quercus sessiliflora* appears, and soon the hills to the east are covered with this white oak.

WE climb the divide:

Crataegus (bottoms!)

Rosa canina

Lotus corniculatus

Cnoris (procurrens)

(*Dorycnium*?)

Rhamnus Frangula

Eryngium campestre

Ligusticum pyrenaicum

Pastinaca sativa form pratense

Verbascum pulverulentum

Galium verum

Centaurea (*Scabiosa*)

Leucanthemum pallens ! *Santolina chamaecyparissus*.

A dry bare hill.

(*Brachypodium ramosum*)

Genista Scorpius

Thymus Mastichiana

Santolina scorpius

The descent towards Burgos is already poorer in vegetation. At the last station (valley) there is an extensive forest of *Quercus Ilex*, with a few *Q. sessiliflora*. Undergrowth--*Cistus*. To the east, the hills still show *Quercus sessiliflora*.

Although the valley (Burgas) is poorer, the r.R. track still bears a rich stand of most of the species already studied. No *Galium verum*. Roadsides again show *Populus*, elms; and a few walnuts.

-----Burgos to Santo Domingo de las
SILCS-----

July 24, 1916

Tomorrow is fair in Burgos. We met at least a hundred ox carts bringing timber. One team consisted of two cows with a donkey as leader. Roadside;--"Solidago"

The hills offer a few ;
Quercus sessiliflora

with,

Genista scorpius
Cistus laurifolius
Lavandula latifolia
Thymus Mastichiana

Before reaching Cuevas(Quarries)we see to the south of us ,the limestone ridge which extends to the monastery of Silos. It bears *Juniperus communis* and *Genista Scorpius*.

To the north and northeast, for miles , the hills are covered with *Cistus laurifolius*, showing a few *Quercus sessiliflora* and rare *Juniperus communis*. *Erica cinerea* also becomes abundant and practically covers open spots. *Cistus* and *Juniperus* in the bottoms . *Erica vagans* L. is also abundant. *Thymus Mastichiana* and *Genista Scorpius* invade abandoned fields. A lone *Asphodelus* was seen.

At Cuevas we change stages; henceforth we remain in limestone (excepting in the immediate vicinity of Covarubias). From now on *Quercus Ilex* is the vocation. At first the scrub oak stand is vigorous enough, mingled with.

Juniperus communis
Crataegus

Rosa agrestis
Genista scorpius
Rhamnus Frangula
Brunella alba

Phlomis Lychnites
 -Herba Venti

Thymus Mastichiana
Verbascum pulverulentum
Gentaurea Scabiosa
Chondrilla juncea

Leucanthemum pallens
 on Roadside;

Hordeum murinum
Rhamnus Frangula
Galium verum

"Solidago" is wanting up to Covarrubias but here appears (silicicola?).

- Silica; Antherinum (small blue)
- Genista scorpius
- 6 - (villous species)
- Sp

- Thymus Mastichiana
- Campanula rotundifolia
- Santolina chamaecyparissus!

Again we enter into the limestone region.
Sunny hills;

- Juniperus communis L.
- (thurifera)

- Genista scorpius
- Daucus carota
- Lavandula latifolia
- Thymus Mastichiana
- Santolina chamaecyparissus (rare on lime)

Scolymus hispanicus
Bottoms offer fine walnut trees. One was a meter in diameter. The monastery of Los Silos has some fine specimens in its orchard. The dining table was sawn out of a single tree, 4-x-10 feet. A Beauty!

The last high ridge before Los Silos, has a carpet of a creeping plant ("Gajuba") I have lost my specimen (432) probably Calluna vulgaris.

The association is a cut forest of Quercus Ilex. Only shoots remain. These mingle with Juniperus communis-- thurifera L. Juniperus communis is usually scarce. The clearings are covered with Lavandula latifolia. Rare is an Erythraea. Asphodelus albus is a curiosity.

- Thy-The top shows
- Quercus Ilex
- Juniperus thurifera
- "Calluna vulgaris" (432)
- Lavandula latifolia L.

Sedum album
again with the valley Genista scorpius again appears.

Here. *Sedum* sp.

Euphorbia *Characias-acias*

Verbascum *pulverulentum*

Jasione *montana*

On the southern slopes, to the base, *Juniperus thurifera* is abundant, some times pure. Some trunks were 2 feet in diameter. At first *Quercus* and *Juniperus* mingle but nearer the monastery only the conifer remains. The rock is to dry and bare.

The priests said, that the peasants scraped of the humus, to be used as fertilizer. No wonder only *Juniperus* can survive. If still more barren, *Lavandula latifolia* is the only plant that can live?

Throughout the Sierra we find good apples, otherwise we only see grain patches. (*Covarrubias*-g vines)

We passed many villages. Our mail carrier only received one letter from these villages. One of our horses had horribly broken knees. Awful abuse anyway. These beasts don't last long anyway, that's sure. In the garden of the monastery *Federa* was abundant. *Tussilago Farfara* in the ditches. In the walls; *Sarcocapnos lanacophylla* DC., *Chaenorhizum minus* L. (var. ?)

In the garden I note:

Sequoia gigantea

Filix europea

Diospyros Lotus L.

Two tall *Laurus nobilis* (with a tall *Cupressus sempervirens*) grew in the cloister; they had trunks a foot in diameter. Remarkable resistance, as the temperature falls here to 17° below Zero.

-----25, July, 1916-----

DEEP GORGE.

-----LOS SILOS-----

In the monastery valley, near the creek;

Sinapis incana L.

Crataegus

Rosa canina

Medicago falcata

Rhamnus frangula
 Ligustrum Pyrenaicum Goun
 Pastinaca sativa formpratenensis
 Verbascum pulverulentum
 Galium verum
 Centaurea caerulea
 -Scabiosa L.
 "Solidago"

A "bunch grass" formed a carpet (Brachypodium
 m ramosissimum Ramosum ??)

Bellis perennis
 Hieracium pilosella
 Trifolium

DRY hillsides,

(Cynodon Dactylon) !
 Genista scorpius

14g-

Ononis (procurrens) Lavandula latifolia
 Lavandula latifolia Vill.
 Thymus mastichiana
 Echium pustulatum
 Plantago (bushy) Convolvulus
 Convolvulus
 Santolina chamaecyparissus

CREEK:

Populus nigra
 Salix incana L.

We enter a narrow, deep valley.
 Dominant on the hillside:

Juniperus thurifera
 S Genista scorpius } Slides
 Lavandula latifolia

Subordinate. Brachypodium ramosum R. & S.
 Juniperus communis (det.)

Alyssum spinosum L.
 Linum tenuifolium L.
 Euphorbia charias
 Nepetella L.

Thymus Mastichiana
 T - Vulgaris L.

Filago arvensis L. (a variety) approach
 F. lagopus.

The stream has cut a gorge 3 feet
 wide and several hundred feet high,
 through a series of steep limestone cliffs.
 Here we have a typical "Majorcan" treasure

66
box; unfortunately too late in the season.
Near the water grew *Sorbus Aria* Grant
z and *Tussilago Farfara*

IN CREVICES/:

Asplenium Ruta Muraria
- *trichomanes* L.
Cystopteris fragilis Bern.
Cynosurus elegans Desf.
Silene Tejedensis Boiss.
Arenaria Grandiflora L.
Helleborus foetidus
Arabis alpina L.
Sedum
Geranium pyrenaicum L.
Campanula rotundifolia L.

Bellis perennis

No oak was seen in these hills today?

66- MONASTARY

-----SAN DOMINGO DE LOS SILOS-----

A vast building (Installation) is modern, as far as guest chambers are concerned. There a magnificent old was bureau in my room. In fact all the furniture is ancient and interesting.

The glory of the monastery is the cloister. Romanesque; two stories. The upper of less value; the lower ornately sculptured, with most interesting subjects. Animals, plants,

Human beings, drinking scenes etc. There is, to some extent, oriental influence (Mudejar). Some old columns date from gothic times. Probably from a building that stood on the same spot.

The ceiling, beamsets, are covered with curious, naive paintings.

The charm of the place is the atmosphere of rest and peace, that pervades all. In the, no talking aloud is permitted in the cloisters and halls.

The priests commence their religious services at four o'clock in the morning. Then they rest in contemplation. Their oratorio sets demand from 4 to 8 hours, according to the day. I attended several services. There was no alternative. Moral obligation!

Fine music! It is a center of Gregorian chant, and is a cult here.

The themes being given by old manuscripts in the monastery library. Several young men had come here to study this music.

Between neophytes and priests I judge there are 100 inmates of the institution. They all dine together. Plain wooden, walnut tables. Food good but simple. Wine allowed. Lettuce at every meal. They served us a guests coffee after dinner. During the meal absolute silence reigns. A priest, perched in a balcony, reads from a religious book half the time in Spanish and half in French.

At a signal, the meal-prayer commences and ends in prayer. The head man censing and the chorus answering. The discipline seems very strict.

Church was attended by the villagers in a body. Naturally, the live off the monastery. It is a dreary dilapidated village.

Plenty of good water enables the priests to raise all the flowers and vegetables they desire. In spare moments the brothers flock into the garden. It is an event in their lives to have guests. The prior washed our hands the first we entered the dining room.

The priests assigned to accompany us, were Padre Alfonso and Padre Ramiro. The latter (R. Pinedo) is an interesting chap. A pharmacist and Physician he has worked in the Institute Pasteur. He has seen life in all its phases; and certainly was a jolly good fellow. He is as full of stories as a veteran commercial traveler. Hovela

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How he comes to be a priest, beats me!--!

Here men from all walks of life have sought peace of soul. Physicians, artists, architects, lawyers, soldiers. This order, Benedictin, is originally french. they all understand that language.

To my surprise I hear they do not make their liqueur, anymore; They the factory of Fecamp, to use their name for the tribute of 25,000 francs a year.

During

-----October 8, 1916-----

-----BURGOS TO LEON-----

The usual horizon of bare hills and watercourses lined with monotonous populus nigra. Half way between Burgos and Palencia appear the first vines, also some Quercus Ilex.

Sparse stands of these oaks, further on, but are replaced on dry slopes by a brush of Juniperus. At vilodrigo, vineyards and Quercus Ilex are more numerous. Here also are troglodyte dwellings.

From Palencia to Leon the entire region is rolling plateau, bare and sunburnt. All plowed for grain but half left in summer fallow. From 90 kilometers north of Palencia to Leon (123 kilometers), the occasional vineyards cease entirely. At 73 kilometers is an extensive patch of Quercus Ilex scrub. Further north the entire region has Quercus sessiliflora as vocation; as shown by occasional suckers in waste places.

During the trip were seen; a few Ros a, Helichrysum? and other composites, and a Thymus.

-----LEON-----

Bottoms are irrigated Pastures lined with Populus nigra. (see commercial photo) Once the grain is harvested, the surrounding country seems a desert.

The villages passed today are composed of miserable earth colored shacks. always, a huge, splendid cathedral rises from amongst these hovels. The square church tower is the conspicuous feature of the landscape. Larger places may show a half a dozen of these towers. All the wealth of the country has been swallowed by the church.

Leon is not large, and is the usual type of a Spanish city. A number of new massive buildings give it a modern and more prosperous look. The interior of the cathedral is fine; a most pure and classic style. Beautiful windows!

In the monastery of S. Isidro, they are uncovering a precious Romanic cloister, and church has been hidden from view for hundreds of years, by walls of stone. This ugly shall was probably erected at the time of an invasion. The carving has been thus conserved in its pristine freshness.

I listened to a washerwoman singing:
"Yo me case con Antonio, Ahora siempre
me presta pagando."

----- PALENCIA -----

A small uninteresting place. Curious arcades cover the sidewalks. Many factories here; particularly of cloth.

The park of Palencia bears the stamp of dryness.

Sequoia gigantea (one, miserable)

Abies

Cedrus

Pinus sp.

Picea halapensis

Taxus baccata

Ailanthus glandulosus

Robinia pseudoacacia

Sophora

Aesculus hippocastanum

Ligusticum

Veronica Lindleyana

November 27, 1916

-----BURGOS TO MIRANDA-----

Burgos had draped herself with snow. All was white to the top of the divide (Ebro) at Castil de Peones. From here to Bilbao there was no snow. Only the range west of Calva da de Burela (427 kilometers) and the highest crest of the Cantabrian mountains, were white. With the Atlantic slope we had rain. As we approach Bilbao it was dark at ~~4:41~~ 4:41:18--
4:41:18--
4:41/2 P.M.

The Atlantic sector and the Castilian plateau are different in everything.

Climate, people, and architecture. Northwestern Spain seems more like Switzerland than Iberia.

The lower reaches of the Nervion valley show a series of factories, producing cloth, sacs, paper, iron, sheet tin, paper, etc. Wealth and luxury stamp the homes. In the gardens are fine conifers. At Arduña I saw a good Sequoia gigantea. The crops are apples, beets, maize, and in the lower regions vines on trellises.

The Atlantic slope is characterized by the presence and abundance of *Pteris aquilina* and the *Ericaceae*. They lap over the summit, but only for a short distance, into the Castilian sector. In such cool stations, facing the plateau, we may also see rare *Fagus*.

The crests and slopes exposed to the Atlantic are densely wooded with *Fagus* and *Quercus* (*sessiliflora* or *pedunculata*). Alternating or mixed. Pines are rare and then always planted. The dominant of the formation is *Quercus sessiliflora*. This oak also runs over into the central region clear to Miranda and even further. In the warm Ebro region, it seeks the lower, moist region; but on the slopes more or less white oak mingles with *Quercus Ilex*.

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The warmer limestone crests of the Ebro, however, always bear *Quercus ilex*. In the higher stretches of this a few pines are

Bassin
a few pines are sprinkled among the oaks. These are probably planted.

Here a dense evergreen scrub would seem to indicate that *Quercus ilex* was once more abundant.

A few, but rare, *Quercus ilex* are occasionally seen in the Atlantic sector. Ten miles south of Bilbao in the valley of the Nerion, there is a regular wood of the live oak.

The lower reaches of the Atlantis present an association of *Quercus* (sessiliflora or pedunculata) and *Castanea*, the latter probably spontaneous. Where the forest is cut over, *Quercus* is said to be killing both *Quercus* and *Castanea*.

Juniperus communis is common from the Ebro to Bilbao. With it (*Ulex Galii*) is dominant.

The entire Atlantic region is covered with a dense green mat of grass, and *Hedera helix*. Mistle was seen.

The watercourses of the upper region show *Salix*. On the Ebro side a few *Populus*. The latter region also offers *Crataegus* and abundant (*Buxus*?).

(----- Nov. 28 1916 -----)

BILBAO

The city shows a strong influence of the English. Especially in the style of the homes. It lies 7 miles inland, at the head of tidewater. Only steamers of 4000 tons can go clear up. Further down stream, the water deepens. A series of factories (mainly iron smelters) lines the river clear to the sea. Villa occupy the coast for miles. Some are palaces. It is a surprise to see so much luxury in Spain. The houses up to date. The view of the coastal mountains is picturesque. The gardens, near the sea all have pines (some *P. pinea*). The streets are lined with *Platanus* and rare *Ulmus*.

In the Bilbao gardens we note:

- Taxodium distichum*
- Cupressus*
- Phoenix canariensis*
- Chamaerops excelsa*
- Fagus*
- Quercus pedunculata*
- Ulmus*
- Populus nigra*
- Laurus nobilis*
- Magnolia grandiflora* (fine)
- Aesculus hippocastanum*
- Ligustrum japonicum*
- Veronica Lindleyana*
- Eucalyptus globulus*

Apples numerous and vines on trellises.

A funicular railroad takes you to the top of the hill, where a restaurant and childrens games attend. A camel was grazing with the donkeys. There from here is fine. It resembles lower Switzerland. The higher peaks in the distance are snow clad. The hills to the west bear a little brush; otherwise all is bare, closely settled.

Some *Castanea* was seen, spontaneous. The vocation (testimony of sprouts) is certainly *Quercus sessiliflora* Salisb., with more or less a variety of *Quercus lusitana*. Brush is a secondary formation.

- Pteris aquilina*
- Ullm gallii*
- Erica cinerea* L.
- *tetralix* L.
- *vagans* L.

The ground is covered by a dense mat of grass.

- Deschampsia flexuosa* Griseb.
- Potentilla reptans* Sibth.
- Viola odorata* L.
- Lithospermum prostratum* Lois.
- Cirsium filipendulum* Lge.

There can be no doubt that the country was once covered with white oaks. The surrounding hills show many mines.

It's cold; but at least it did not rain today.

November 29, 1916

-----BILBAC TO GRAMERIC-----
(30 kilometers up the valley)

We pass a network of cables, railroads, quarries and mines of iron, and great factories. At noontime dozens of blasts are set off. At first, the region is bare. As we leave the industrial quarters, gradually woods appear and continue as far as we go.

The dominant is *Quercus sessiliflora*, a few *Castanea* (also spontaneous; but not native). In the highest, the moist gulleches show a little *Fagus*, with *Quercus pedunculata* Ehrh. A few patches have been planted. In the creeks I notice a dozen or so of *Quercus ilex*, also *Populus* and *Alnus*.

In the dense woods, *Pteris aquilina* is almost pure as undergrowth. Where more open:

Ulex Gallii !
Erica cinerea L.
- *tetralix* L. } HIGHER
- *vagans* L.

Rubus is perhaps introduced. Beets! apples, grapes and rare walnuts. Thy houses are of typically Swiss architecture.

Churches have the covered porches one sees in Sweden. Handsome conifers and *Cedrus*. It rained as usual.

BILBAC

Wall:

Aspidium aculeatum - H. Doll.
Asplenium trichomanes L.
Polypodium vulgare
Smilax aspera
Scole

74
Scolopendrium officinalis Sm.
Hedera helix
Valeriana officinalis
Mistletoe was seen on Quercus, F. pulu
s and apples.

----- (Dec. 2, 1916) -----

Bilboa to Santander.

The entire region has as vocation
Quercus sessiliflora Salisb. mixed with a
mixed - of a variety of Quercus lusitani
ca - Lamk.

The forest is especially abundant
nearer to Bilboa. in the valleys, now and t
then, is an isolated Quercus illex. (a good
stand in one spot). Creeks - Salix, rare Aln
us. A few Castanea and rare walnuts. In the
brush, along creeks and on the mountain
slopes, especially on the latter. Probably
Arbutus Uneda L. Sometimes it
is dominant. Bare slopes show the usual
Ulex Galii (which is also common on the
coast at Santander). Juncus in spots.
Erica Tetralix L. is common, particularly
early Bilboa (-near). Pteris abundant.
Juniperus communis. An occasional Erica
(arborea) is in bloom. A few stands of
pine are planted.

Pastures
Apples
Cherries

At Melinar (52) kilometers from
Bilboa a range of limestone hills cuts
through the slates. It bears an interest-
ing flora, in which Quercus illex is domi-
nant. It would be worthy of closer stud-
y.

Now we enter a beautiful valley.
The river (swollen by an enormous fresh-
t) has lately torn away the banks. Then
the salt marshes of Santona (penitentiary)

have in sight. Some groves of pine have been planted on the sand dunes. The land has risen, as where stand these pines, the spanish Armada left for England.

Santandar offers salt marshes and bare sod-covered hills. All land is intensely cultivated. A blast furnace is past. The only brush noticed was *Ulex* *Galli*. Near town a fine *Quercus Ilex*. Avenues planted with *Eucalyptus*; but in town the shade tree is *Platanus*. On walls *Hedera* and *Polypodium vulgare*. *Cenifers* are planted, but look badly; particularly *Sequoia gigantea*. A *Cupressus* and *Araucaria* (imbricata) were the best.

Young *Phoenix canariensis* are common. A *Phoenix* was fully 30 feet high.

Dactylifera was- Fine *Magnolia grandiflora*. Near the coast (Sardinere) *Pinus pinea* has been extensively planted in the parks.

I saw a large orange tree, covered with fruit, in town. Although this would on to expect a mild climate, there is no exuberance of the vegetation. It is true that this is no time of the year to judge.

The hotel is not heated at Bilbao it was (and needed it badly). There is undoubtedly, a big difference in the climate of the two cities. The coast road offers a fine view. We pass the royal alpalace lying on a peninsula. From there a full view of the Picos de Europa and its snow clad range is had. A big hotel is being put up at the point.

Santandar harbor is good, it is picturesque and has an excellent beach (Sardinere). The natives are trying to become the place. One feels that Bilbao and its coastal towns, have more money. Here the finer residences are those of transient. However the stores are as good as at Bilbao. Particularly the stocks of diamond. THE population here is floating, at Bilbao.

it is resident. the latter has the wealth; I marvelled to see coaliers being unloaded by women. Long files of them pass from the ship to the r.r. car; each woman with a 100 pound basket on her head. All are singing. Peer beings! I suppose they would knock the stuffings out of me, if I tried to pity them. As it rains so much? The work ers and peasants wear wooden shoes, raised on two pegs. A funny clatter on the sidewalks! It is a sturdy race.

-----SANTANDAR TO OVIEDO-----

-----Dec. 3, 1916-----

Peer night! A vessel, loaded with coal, discharged in front of the hotel. The women kept up an interminable chant and chatter. In the morning hear frost covered the land. Thy higher crests of the coast ranges, and, of course, the summits of the Cantabrian range - chain were snow covered. The view of the latter, which we passed in the afternoon, was particularly fine.

Every peasant wears wooden shoes, mounted on four pegs, like stikts. This makes an awful clatter on the pavement.

The valleys of a limestone region were particularly rich and luxuriant. With exception of this belt, the vocation is still Quercus sessilifera. All creeks show abundant Alnus. Half way to Oviedo a few Tamarix also were seen. Salix is less common along creeks, but more so in hedge s and bottoms.

Castanea is not rare, and becomes more numerous approaching Oviedo. Apples and maize also increase. Many balconies are covered with strings of corn cobs.

Several fields showed beets planted after corn. Big piles were seen at the stations.

Every farmhouse has a curious granary, built on piles, covered with a big flat stone. "Per die Mausen"; The architecture resembles Switzerland. *Ulex Galii* dominates in all cleared spots, indifferent as to soil or exposure. *Pteris aquilina* also is common. Invidentials are (*Calluna*) and a tall *Erica*.

Quercus Ilex must be mentioned. Throughout the lower slopes, and on river banks, we may see a rare, isolated specimen. Then at Treceña, a limestone ridge appears, which is covered by and has the live oak as vegetation. (With a few *Quercus sessiliflora* in moist gullies.). This limestone ridge belt runs to the ocean, and the Encino also.

Limestone, with *Quercus Ilex* vegetation, extends from Celambres (81 kilom. from Santander) to Ariendas (148 kilometers).

Frequently it has been cut out, and in spots the influence of man has enabled *Quercus sessiliflora* to live on the rocks. The white oak may be native in some bottoms. It invariably appears on dikes of silica.

ON lime there was some (*Arbutus Unedo*) (*Illex*, *Villahona*); but generally was composed of *Ulex*. Here (on limestone) some fine *Quercus Ilex* were growing alongside of an Orange grove; one quarter of a mile from the Atlantic. At Peneles (lime) fine *Castanea*, old walnuts, oranges and *Quercus Ilex*. *Rubus* common.

COMMON.

Castanea (not native) Walnuts
Walnuts
Eucalyptus
Cenifers
Pines
Cupressus
Cedrus
Betulus (rare)
Platanus

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Towards Oviedo, we note two tall ferns.
 Towards-Occasional Clematis, Smilax aspera
 Hedera, Crataegus, Junco, Salix, Populus.
 Mistletoe on apples and oaks.

Gardens;

Chamaerops excelsa
 Yucca
 Laurus
 Magnolia grandifolia
 Mimosa
 Acacia

PASTURES!!!

----- Oviedo to la Rebla 666 -----

----- Dec; 5th, 1916. -----

I trained all day yesterday .AS
 we climbed out of the clouds to the summit
 today, we could see the dense mist below us.
 Whilst we were in this bank we did not
 see anything.

Oviedo is a bum place. Dirty. Hotel
 dear. The only thing worth seeing is the
 cloister and the altar of the Cathedral.
 Half of the population wears wooden shoes
 ; the clatter is infernal. Today, at all s
 tations, clear to la Rebla, this clatter i
 is heard.

The university is a small and miser
 able. Botany and mineralogy (for all I know)
 geology taught in the same course. The
 latter consists of 4 hours Dry lectures a
 weekend and 2 one and one half hours prac
 tical work. 6666 \$\$\$\$\$!!!!!! OH!!!! !!!!!

The land of the lower region, is
 devoted to an intense culture of apples,
 and the is covered by a sed. Castanea is c
 common, particularly higher up; where, on
 the higher mountains it mingles with Que
 roux sessiliflora. It is certainly plante
 d. A few m walnuts, and an occasional line of
 Corylus on slopes. Apples! and abundant ap
 corn are the staples however. Again all ba

balconies have their strings of Cern cabs. Apples cross the divide towards Leen but soon dwindle out. Nearing La Robla A vitis clammers over a house.

We pass three climatic regions today.

A. Rain and mist

B. Snow

C. Cold and dry. With blue sky.

The scenery of the mountains is beautiful; with pretty snow effects. The snow was heaviest on the Atlantic side. On the summit a tall Erica (arborescens) dominant in spots, was bending under the weight of snow. (Calluna) was dominant on some of the sunny slopes of the divide facing the Atlantic. In a gully, here, I noticed 3 Betula. The false Betula. Also some Helleborus. The bare hills on both sides of the divide always show green turf.

On the Atlantic side creeks show Alnus exclusively. On the plateau Populus Alba and low willows, (with Salix on the highway.).

The vegetation of the Atlantic sector is Quercus sessiliflora. The hills are more less wooded. At 1000 meters, the snow commons. Here in moist gulches, gradually Fagus mingles with the oaks, until finally all slopes, clear to the subalpine meadows, are covered with a fine growth of Fagus. The trees are young; proof of human influence. Fagus crosses the divide. The Cinerea (40 kilometers from Leen) near Cinerea, Fagus was seen on north slopes; whilst close by, (Santa Lucia) on limestone, Quercus ilex appears on southern exposures. A few conifers were planted in the mountains.

From Oviedo to the Crest (some-where-the-crest some lap over)

Rubus (Rosa replaces it on the plateau)

Pteris

Ulex Galii

Spartium junceum (covers the in pure stands)

Federa helix

80
A little Clematis was seen on both slopes.
Crossing the divide, the snow gradually disappears, although, clear to the region of Quercus Ilex, the stagnant water was frozen.

Some Picea were planted in gardens and looked well.

From Cinerea to La Robla (26 kilometers from Leen) we pass carboniferous limestone belt. There are many mines and the creek is black. Here at first sparsely, then abundantly, (at La Robla) the entire southern flanks of these ridges bear stands of Quercus sessiliflora- Ilex. It attains fine growth at La Robla. On the northern slopes, however, there is a pure stand of Quercus sessiliflora brush (out of forest). As seen as the soil changes, the white also appears on the southern flanks. The undergrowth of the white oak association is Spartium. In parts an Erica covers the hills and Ulex galii still exists.

LA ROBLA is miserable, dirty and peccor. -?

(In the Revista de Montes) Nov. 15, 1909;
Statement that the most southern occurrence of fagus in Spain, is a patch of 200 acres, altitude 400 feet, at TORRELAGUNA.
012° 0.12° east of Madrid 41° 7' latitude.
Formerly it was more abundant.

-----LA ROBLA 555 (Leen) to Bilbao-----

Dec. 6, 1916

(Distances noted are in kilometers from Bilbao)

The sky was clear, but snow had fallen; and during the entire day the white mantle interfered with my observations. The Atlantic side had a particularly

heavy fall and the flakes still came down. Not until we reach kilometer 50, did WE see the green. Here rain replaces the snow and we had an ink black sky. (On the 7 Dec. at Bilbao, we have a typically rainy London day.)

For the entire distance from la Rebla to Bilbao, the vegetation is *Quercus (sessiliflora)*. However trees are few; the region has been almost entirely cleared; only sprouts remain, as witnesses.

Woods are more common south of Gistierna (268 kilometers). Here *Pteris aquilina* was abundant for a few miles. Elsewhere no *Pteris* was seen. With it were the usual; *Erica* (abundant for miles)

(*Spartium*)

Stands of young whiteoaks were abundant between Gistierna & Guarda (221 kil.) Oak scrub between 165--176 kilometers; before Ebro- Ebre river; and from there to the Atlantic water shed. (54 Kil. 113)

At Kil. 130 *Fagus* mingles with the oak. It is abundant at 110 kil. and sometimes pure. At Kil. 100 oaks predominate; but a few ancient beeches remain for 7 kilometers. This is the watershed, and for the first time we see trees of oak. *Fagus* disappears after an extent of 80 kilometers. Here the white still has its leaves. Possibly it is a different species. Where cleared, only the seed and a few prickly shrubs remain.

Rosa (dominant)

Crataegus common

Rubus in spots

Hedges are almost always with *Salix*. Roadsides and creeks lined with *Populus (nigra)*. Creeks also offer a low *Salix*; whilst the Ebro (115) kil. shows a gallery of *Alnus* like the streams of the Atlantic.

As said, for miles after la Rebla; we see hills covered with *Erica* and more or less (*Spartium*). As oaks increase they become rarer. The shade of the dense foliage seems to kill them.

Nevertheless

Nevertheless the dominant in the undergrowth usually is *Erica* (*arborescens*). Sometimes for miles nothing else is seen. North of Guarda (221 Kil.) a long range of hills is called Sierra de Brezo. Guarda seems a good center for the exploration of the Cantabrian range. However the question of Fendas is to be considered.

For miles (at Kil. 220-270) the ground under the dominant *Erica* (*arborescens*) and white oak sprouts, is covered by a creeping plant, probably a *Vaccinium* (goes to 219 Kil.) Here also was considerable of a silvery bush (*Helianthemum*?) A little *Calluna*, (?) (*Erica cinerea*?) Some *Ulex* (*Galii*) was noted at Kilometers 270, 230, 200.

This *Ulex* is the exclusive growth on a limestone ridge at 175 Kil. 5 (Vegetation *Quercus Ilex* destroyed). Other denuded knolls (lime) (Kil. 260) showed (*Thymus*). In the first half of the journey, the (*Spartium*) is abundant. On the Atlantic slope, it is then restricted to the R. R. track on the plateau at 220 Kil. it is absent.

From Kil. 260 to nightfall, 6" *Calluna* (probably *Erica cinerea*) is not rare. I saw spots abundant; from Kil. 260 Kil. 292 300 on the plateau, wherever flat (acid?) offers miles of this "Calluna" Pure. (We note such stands at Kilometer 2180, 150. 115.90.)

A few pines are planted in the mountains, but do poorly.

In this part of Spain limestone cliffs, bluffs, mean *Quercus Ilex* on southern slopes. (I recall the extensive stands North of La Robla.) On the range of high limestone hills which crop out on the railroad, once *Quercus Ilex* covered the warm lower slopes. West of Salinas it has entirely disappeared. West of (Kil. 176) and "Ulex" has taken its place. Stands are seen from Kil. 286. to 176.

We note *Quercus Ilex* AT *Quercus*
Cisterna
Kilometers 221. 217. 190.

From Salinas (176 Kil.) to Cadagua (59 Kil.) it disappears. Here might fall; but I recognized a few big *Quercus sessiliflora* amongst the rich stands of *Quercus sessiliflora*, probably on lime.

At 93 Kilometers, once more apples and pears are abundant. Bee hives are numerous in the mountains.

Coal mining is the great industry of the region passed. All exploitations have a shiftless, temporary stamp. A big mine west of La R'bla brings its coal for many miles by cart. To satisfy the war demand they have lately bought 150 mules at 200 dollars a head.

Everybody has the usual complaint about the government. There is a lack of R.R. cars, and the station masters reap a harvest of graft.

-----BILBAO TO PAMPLONA-----

Dec. 8, 1916

(Distances are from San Sebastian.)

All the way clear to the summit the vegetation is *Quercus sessiliflora*, with more or less of *Quercus lusitanica*. The trees have been capped (style Osier willow). All elder trunks are enveloped by *Hedera* and *Polypodium vulgare* grows in the forks. The woods are open; most land has been reclaimed. Denser stands were noted at 21 Kil. and also at 93 K. At the later station a few *Fagus* are seen. One fine beech stood on the river bank. Some *Betula* were probably planted, as roadsides were had them as shade trees. Throughout the region *Castanea* is common. To the ocean side, planted or run wild.

The undergrowth is:/

Dominant;

Ulex galii!

Pteris aquilina (sometimes pure)

More or less;

"Calluna"-(Erica cinerea)
Rubus l

Rare;

Smilax aspera
Salix(col.)
Tamus(red berries)

As we approach the coast at 52 Kil.
a few Tamarix appear in the creek. The
streams show Alnus and rare Populus and a
dwarf Salix.

Throughout this region(Atlantic)
limestone is indicated by Quercus Ilex.
(A few Fagus) Here there is much Arbutus
Umedo

Throughout this Atlantic region,
limestone is indicated by Quercus Ilex
(on the sunny slopes). A few trees,
near houses(95 Kil.) may have been planted.
On shady sides frequently a few white oak
come in with it. At Diva, Near (coast)
between 52 and 45 Kilometers a wide strip
of limestone offers a regular forest of
Quercus Ilex (a few Fagus). Here there is
much Arbutus Umedas undergrowth, ?
which becomes dominant in clearings.
After Deva the soil is probably rich in
Calcium, as for 3 Kil. live oak remains.
Quercus Ilex at 62,--54,--52,--45--Kil.

- 36 Kil. (doubtful soil)
Vocation. Quercus Ilex
Incidentals; Betula, Arbutus.
- 34 Kil. (limestone)
Live to coast, with incidental Fagus.
Vocation (a mile wide) Quercus Ilex
Undergrowth; Ulex Galii; Pteris.
- 30 to 27 Kil.
Vocation, probably, Quercus Ilex, but mi
ingled with Quercus sessiliflora and
Fagus (both planted?)
- 27 Same, live oak rarer.
- 22 Kil. (Lime*) Quercus Ilex

A high limestone ridge south of Duran
so perhaps would be interesting to explore.

The brush and bottomseffer a scrub willow.

In the woods a few conifers have been planted, but look poorly. It is only in gardens, that they look fairly well. Cupressus, Abies, and Sequoia gigantea. P on the coast I note oranges and lequet.

On house had a grape-vine climbing on it a trellises. The great crop is apples (many bear Mistletoe), beets and corn.

At Eibar Platanaus lines the street and we see Magnolia grandiflora. We pass many factories of fire arms. The fields are green, and covered with sed.

At La Sarte (9 Kil. from San Sebastian) we changed cars. It got dark. As we near the summit more or less snow is seen.

Fagus mingles with the white oaks, and often is in pure stands on the higher reaches.

With the Pamplona region we enter a bare plateau.

Today I noticed an auto being hauled by oxen.

Two "Backfish", accompanied by their father, (of pure celtic type) came into my compartment. For 5 minutes they recited prayers, one leading, father answering. Then the girls played the guitar and sang all day long, as happy as Bumble bees. Typically spanish.

-----PAMPLONA-----

9, December, 1916

Have a bad cold and as it rained all day, I spent most of my time in a caf. I saw a young negre in the street, brought by one of the german refugees from Cameroun. Visited the cathedral. The painted statues are noticeable; fine cloister and ironwork.

Spent some time in the museum of Sarasate, in the City Hall. All his treasures and furniture are here. Many Diamonds, gifts of Rothschild and King Alfonso. 12. A fine diamond mounted watch and chain is the gift of the Spanish club of Mexico. A set of diamond mounted studs (King Alfonso is said to be incomplete. The sleeve buttons were thrown down to a bullfighter by the "Aficionado", in the enthusiasm of the moment. Although a pupil of the Paris conservatory, Sarasate certainly was a true Spaniard.

I was much interested in an article on student strikes, by Unamuno. He says that many University professors have but 80 hours of work, the entire year, inclusive of examinations.

"España es un vasto Hospicio".

In the parks ;

Abies
Pinus — NOT BAD
Taxus
Thuja
Sequoia gigantea (4 feet at base)
Salix
Populus
Ulmus
Gynereum argenteum
Yucca
Chamaecreps excelsa
Magnolia grandifolia
Cereis (fine)
Viburnum Tinus

-----PAMPLONA TO ZARAGOSA-----

December 10, 1916

Entire region bare. Knolls and waste places covered with (Thymus Vulgaris) and "Ulex" of Burges, (Genista Scorpius)?)

in bottoms a few willows, but usually Grataegus, with rare Quercus sessiliflora. At Carascal - (61 Kil. from Castejon) and 27 Kil. from Pamplona are numerous Quercus and Ilex This is the vocation of the hillsides from now on. Isolated Quercus sessiliflora appear only in bottoms and on favored slopes. Genista scorpius is seen. and at 45 Kil. from Castejon, the olive is abundant.

From here to Saragaythen,---bare Steppes!! olives, and wheatfields alternate. Watercourses planted to Populus. Night fell. "Thymus vulgaris" and Populus-"Brachypodium ramosum" is all that I could make out. Around towns we see apples! and lots of beets at stations.

Zaragoza:

Clive!

Ulmus

Populus

Platanus

Gleditsia trianthes

ROADSIDE

Perks.

Abien

Cedrus

Cupressus

Pinus halepensis

pineas

Sequoia gigantea

Taxus

Thuya

Phoenix canariensis

Ligustrum japonicum

Viburnum Tinus

Merium Cleander

Eucalyptus

Veronica Lindleyana

~~ZARAGOZA TO MADRID~~

Zaragoza to Madrid

DEC. 14, 1916

The to the mountains the stamp of dry
ness prevails. The R.R. follows a creek be-
bed, in which numerous bridges are being
rebuilt. The lower hillsides and the valley
s are divided by dikes, and irrigated;
even olives are soaked. Around the
villages sweet scapaches, cherries, walnuts;
apples, prunes and abundant grapevines.
Beets supply the factory of Calatayud.

At 190 Kil. olives cease; but appl-
es are still abundant. Creeks: *Arundo Donax*
Salix and *Populus*. (planted)

The lower hills are barren and offer
Thymus (*vulgaris*) and a few *Retama* *sphae-*
carpa. *Foenicula* (*Ferula*?) and *Crataeg-*
us. Then, 290 Kil. from Madrid, *Resmarinus*
officinalis becomes abundant.

Salix *Cavedellerse* brings
limestone. Sprouts of *Quercus* *Ilex* show the
vegetation. *Resmarinus* with more or less *Thym-*
us (*vulgaris*) is abundant. *Juniperus* (*Cxyced-*
rus?) (*Retama* *Sphaerocarpa*) are rare.
Greek ash *Populus*, *Tamarisk*, and *Juncus*.

Merata (272 Kil. Madrid) surrounded
by schists. Here *Thymus* (*vulgaris*) and a bunch
grass (*Brachypodium ramosum*?). At 264 Kil.,
Quercus *Ilex* again announces limestone.
Undergrowth: *Genista* (*scorpius*) and *Thymus*
(*vulgaris*) A little *Santolina chamaecypar-*
issus

CALATAYUD. *Chamaecreps excelsa* and *Acacia*.
Aseza: flat sandstone, *Thymus* & *Resmarinus*.

Kilometer -- 180 --

Horizontal layers of limestone.
Quercus *Ilex*!!

Undergrowth;

Thymus
Resmarinus
Lavandula

Kilometer 175-----

All sunny hills bare Quercus Ilex (mixed with *Q. sessiliflora* on shady sides). *Genista scorpius*, *Lavandula*, *Thymus*, (*Calluna vulgaris*). Vocation *Quercus Ilex*!!

We enter a region of Buzán Bunt-Sandstone. No oaks are seen, but only a (*Retama sphaerocarpa*) in the creek.

The region of Medina Celli is the watershed. The gypsum hills are very bare. A little snow is seen. Seen however, it becomes deeper. Scrub *Quercus* (*Tezza*) covers the crest with *Lavandula*.

Kilometer 155---1100 met. altitude.

Limestone.---Bare by man's influence.

Thymus vulgaris. Seen *Quercus Ilex* appears and extends east. Proof that the limestone mountains back of Sigüenza (145 Kil.) has *Quercus Ilex* as vocation.

Little is to be said of the region between Guadalupe and Madrid.

Roadsides, *Gleditsia triacanthos*. *Quercus* (*sessiliflora*) olives, vines, grain.

Near Madrid we passed a pasture where 500 fighting bulls were held in reserve for the market. Here, surrounded by the animals, women were washing on the river side.

In 1915, on the 17, of July, I entered into the "Residencia de los Estudiantes" at Madrid. In their garden were big bushes of *Laurus Cerasus*, *Ligustrum Japonicum*, and *Eucalyptus globulus*.

MADRID

MADRID

The surrounding hills are sunburnt and shrivelled, and if not a wheat field are covered with *Hordium murinum*. In town they water all day long. All shade trees have cemented ditches and basins around the trees. Not a tree grows without irrigation.

Sophora japonica
Gleditsia triacanthos
Robinia pseudacacia

The suburban parks are formed of *Ulmus* with rare *Platanus*. Some *Ligustrum* is seen. *Eucalyptus* is seen and *Ligustrum* is the common garden plant. In the Manzanares valley towards the Park, we have *Sequoi* a gigantea. Here the dusty roads were lined with big elms. *Fraxinus* in the creek. In one large protected estate was a large forest of *Quercus suber*, and a dozen cords of cork was awaiting shipment. However the dominant is a forest form of *Quercus ilex*, having the tops of the leaves not shiny. Once the entire region of Madrid was covered with *Quercus ilex*. Our road and landscape is thickly coated with dust.

The scene might be anywhere in the foothills of the California Coast Ranges. Irrigation enables maize and alfalfa to be grown. The famous Manzanares at this season of the year, is of the size of the Ceyte.

As far as the eye could reach, the formation was live oak, with young trees beneath. The undergrowth is *Retama sphaeocarpa* Bss. Common *Rosmarinus* (low and stunted) and a little *Cistus ladaniferus*. Otherwise the open woods showed dry grass and a few;

Marrubium vulgare
Eryngium campestre
Carlina corymbosa
Centaurea aspera
Cheperdon Acanthium
Scelyaus hispanicus

Digitized by Hunt Institute for Plantation



RETIRO

statue

Thy entire park is divided into little earth lined squares, and thus, regularly and evenly, all trees are soaked. Underneath the gardeners try to keep it green, the ground is planted to lawns. Generally however, Vinca, Helix, per again violets are used to cover this irrigated soil. The "park" is simply a block of trees, with walk s cut through.

A few attempts at landscape gardening have been made, with lakes (some big ones with boats) and winding drive s. In a dry abandoned corner stood a fine growth of Pinus halapensis.

There is a sunken garden with the usual Buxus hedges, shown in designs, with wResa and Lavandula in the center. Here I saw a beautiful and curious little Thuya or Cupressus, 7 feet high, very effective a amongst these Buxus hedges. Also one or two Laurus nobilis, their trunks are large at the base, which seems to indicate that Laurus has, sometimes to be cut back. (perhaps killed by frost). the growing stem was at least 30 years p old.

- Taxodium distichum (!! 4 feet)
- Cupressus (tall)
- Chamaecyparis
- (Trachycarpus excelsa)
- Nerium oleander
- Hortensia
- Ligustrum japonicum !
- Lagerstroemia (pear)
- Magnolia grandiflora

Thy native Quercus illex is very rare in the park. Across the river in an estate (Casa del Campo of the king) was quite a forest.

- The main tree species of the Retiro are
- Ulmus!
 - Eucalyptus globulus
 - Robinia
 - pseudoacacia
 - Sophora japonica (on roads)
 - Acer (2)
 - Aesculus
 - Ailanthus

Bambusa Fraxinus
 Fraxinus
 Cedrus
 Gleditchia triacanthos
 Pinus pinaster
 - 6 sylvestris
 Populus alba
 Salix (rare)

Madrid is a thirsty country.

-----Botanical Garden -----

Divided into tree-lined squares. THE
 flower beds thus surrounded by paths.
 All the lands irrigated and each plant re-
 ceives the equal amount of water.
 All this growth is in the deepest shade.
 Many of these patches are not used for
 botanical specimens; and are filled with Ir-
 is, as are the dry knolls of Pinus halep-
 ensis. (1-Pinus excelsa).
 All trees are irrigated. The following
 are of good size: -1- means a fine tree.

Abies Pinsapo
 Cedrus Deodora
 - libani
 Cupressus sempervirens (fine pyramid)
 Juniperus macrocarpa (peer)
 Picea excelsa
 Sequoia gigantea (very peer)
 Taxus baccata
 Chamaecyparis excelsa
 Juglans nigra
 - regia
 Salix babylonica
 Populus angulatus!
 - Canescens
 Alnus crispus
 Carpinus americana
 - 6 - Betulus
 Quercus pedunculata
 - rebur
 Ulmus campestris (4 feet)
 - 6 - cordifolia
 - montana

Planera ornata
Maclura aurantaca
Celtis australis L. !
 - *occidentalis*
Merus alba
Laurus nobilis
Phetinia serrulata
Cercus siliquastrum
Gleditsia inermis
 - *micrantha*
 - *triamantha* *Gymneclada*
Gymnecladus canadensis
Robinia pseudoacacia
Sophora japonica
 - *Pendula*
Rhus coccinea
Negunda californica
 - *fraxinifolia*
Acer pseudo-platanus
 - *monspessulanum*
Aesculus hippocastanum
Melia azedarach
Celastrus paniculata
Tilia intermedia
Fraxinus americana
 - *angustifolia*
 - *excelsior*
Diospyra *Naki*
 - *Lotus*
 - *virginica* (peer)
Catalpa bungeana
 - *syringae-folia*
Paulownia imperialis
Viburnum opulus

August 1, 1915

MADRID-----ESCORIAL.

Sandy hills; open stands of *Quercus*
Ilex with *Retama* *Sphaerocarpha*.
 Meister bottoms:

Populus
Salix
Fraxinus

94

We note peaches, a fig, walnuts, and vines.
 Eucalyptus (rare)
 Ailanthus
 Robinia
 Centaurea-(melitensis?)
 Carlina corymbosa
 Onopordum acanthium

As we approach the hills, the landscape resembles a California scene, with its live oak woods and the yellow and brown tones of the distant Sierra. Isolated trees of Pinus pines, mingle with the oak. The undergrowth varies, now one, or the other, or several.

Juniperus (communis) scattered but

Big
 Bunchy grass (Brachypodium?)

Rubus

Ruta (in spots!)

Cistus ladaniferus!

Daphne gnidium

Lavandula!

Thymus (vulgaris?)

Helichrysum stoechas

-----ESCORTIALGEE-----

An immense pile of grey granite, severe in style. Stone balls are everywhere the distinctive mark of Juan de Herrera.

The most feature is the tomb of the kings, pink, gay and green marbles and rich gildings. on the side is a long line of marble sepulchres, for the princes and wives of the royal family. It was Sunday and the noisy crowd was talking in the sepulchre; with no respect for the dead.

The most beautiful in the Escorial are a dozen rooms finished in the beginning of the 19th century, for a king, at a cost of one half of what the entire palace originally cost. Here the walls are hung with richly embroidered silks; all the woodwork is inlaid with costly species. I never saw the like! Wonderful work. Base -beard, f

floor, doors, wainscoting, and floor are on one mass of precious marquetry. Some fine carpets designed by Goya.

It was of interest to see the room of Philippe 2. whose bed looks out upon the altar of the church.

The library is very fine. here is a priceless collection of old manuscripts on parchment, framed and initialled in wonderful penwork, decorated by watercolorers and gilt. Some of these old bibles are written in gold. There is one treatise on chess dated before the year 1000 (?). there are ten times in greek, hebrew, persian etc.

All books are turned t with the face towards the front. this is gilded and the titles written on it. All for the control of bugs. The cases have a wire screen, but no glass. There is a series of books for the mass (1000?) kept in the choir of the church. They are 4 feet high and are exquisitely illustrated in watercolorers.

The material of course is parchment. every page represents a sheep skin. These books are enrollers.

Priceless treasures!!

In the museum also, are all kinds of things. I Carved ivory, Goldsmith's work, a bishops mitre of the most complicated design, made by the Indian of Mexico, from feathers. one sees human figures, one inch high with all the flesh tints given in feather work. What an enormous lot of labor stered here for the monks!

The paties of the palace are filled with shorn hedges of Buxus. The center of the beds is occupied by low bushes of Buxus, planted in labyrinthal style; from above it looks like a lawn.

A fine view is had from the terrace. In the foreground the park, bay-and Madrid and the Sierra Guadarama. The School of Forestry, lately transferred from here to Madrid, has made attempts at reforestation.

The park shows *Quercus Ilex* and *Fraxinus excelsior*. That is, a blending of the mountain and the plain. Here we have a little pleasure palace of some queen, with exquisite silk hangings, and fine paintings, and fine paintings. It is a Jewel-casket.

Before this house stands a group of noble *Sequoia gigantea*, and one *Abies Pinsapo*.

We note

- Cedrus*
- Pinus pinea*
- Quercus Ilex*
- Fraxinus*
- Aesculus*
- Magnolia grandiflora*

P

On the streets planted alternately are.

- Ulmus*
- Fraxinus*
- Acer Pseudo-platanus*
- Sophora*
- Robinia*
- Gleditsia*

-----Madrid to Aranjuez-----

Aug. 15, 1915

The hills offer olives and vines. All well cultivated. The trees are pruned low as in Provence. We see a skant growth *Sphymus vulgaris*, a white Umbellifer, *Eryngium maritimum*, *Galactitis tomentosa* (R.R. track). These dry hills form a marked contrast to the rich bottoms of the Jarama and Tago.

Here: beets, maize, walnuts, figs, alfalfa apples, *Magnolia grandiflora*, & *Populus nigra*. Elms are dominant. Some creeks show Tamarix.



Toledo

Beneath the orchards, there is an intense culture of Strawberries and asparagus.

The main attraction of Aranjuez is its park. Lots of red tape and tips to get into the castle. Nothing much when you get in. True there are a lot of pictures; but the stairway is in stucco. The throne-room a mass of velvet and gilding, in poor taste.

However the "Casa del Labrador" isolated in the forest, is magnificent. Again all woodwork is inlaid with mahogany. Wainscoting and door casings of different colored marbles. Beautiful paintings. A magnificent malachite table 4 feet long. A sculptured bird in ivory. It is a beautiful museum of all kinds of treasures.

The glory of Aranjuez is its parks. They cover several square miles; interspersed with pretty gardens, statuary, arbors etc. Irrigation ditches run everywhere, soaking the ground. The soil is a honeycomb of drains and ditches; probably a heritage of the Arab. So much water, entails malaria during the summer.

Miles of avenues are lined with magnificent *Platanus orientalis*. On one of these sycamores a root had formed Pneumatophores like those of the "Bald Cypress". A *Cupressus* (perhaps a creeping form of *C. sempervirens*) is abundant in the forest. One trunk was 6 feet in diameter.

Sequoia had a (gigantea) queer look: short, stubby, with an enormous trunk.

I note:

- Bambusa*
- Chamaecyparis humilis*
- Abies Pinsapo* (2)
- Cryptomeria*! (2)
- Abies Larix*
- Pinus halepensis* (rare)
- Pinus pinea*!
- Corylus*
- Aesculus* (rare)
- Acer*!



Toledo

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Magnolia grandiflora !
 -6---- (rubra) fine!
 Buxus sempervirens
 Lavatera !!

Merium Oleander (fine)..
 No hose is used to water, open ditch-
 es only. (The water runs under the roads
 in stone pipes.
 Type of gardens.

Hedge
 Buxus (as composite
 Type 5) (as fine)

grass, bushes, fountain.
 ditch flower ditch

MADRID TO TOLEDO

6, August, 1915

Hills--vines & olives.

A lot of Sphaerocarpus

Retama Sphaerocarpa

(Thymus vulgaris)

On track Soperden.

Where a Neria gives water, a
 Potatoe patch. Rare maize. Nearer Tajo bail
 ing alfalfa by hand. Bottoms -- Sugar beets!
 Phragmites. Greek Populus. Aprickly "Genista"

PARK TOLEDO

Eucalyptus

Fraxinus

Robinia

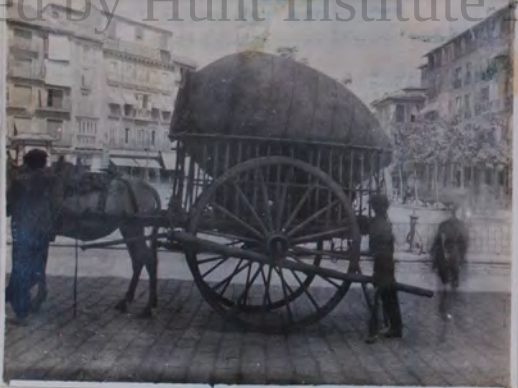
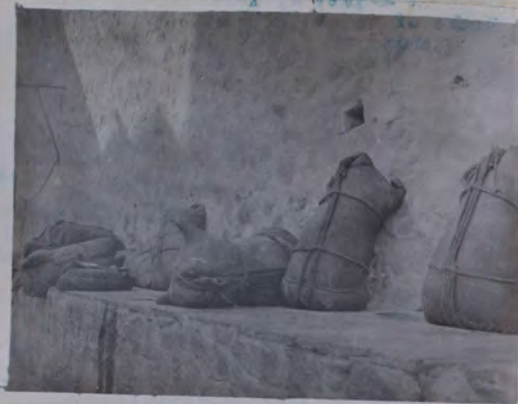
Sophora

Gleditsia

Roads -Ulmus.

TOLEDO

Big groves of olives. Some apples and
 walnuts in the bottoms.



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TOLEDO

to August 3, 1915

Banks of Tajo

Dominant:

Juncus lamprocarpus Ehr.

Cynodon Dactylon Pers.

Salsola Kali L.

On Oct. 13;

Chenopodium Betrys L.

AUG. 3

At the base of the hills. *Glycyrrhiza glabra* is var. *glandulifera* - (run wild) is dominant and *Peganum Harmala* L. - common.

Peganum

Incidentals.

Asphodelus fistulosus

HILLS

Three smaggrasses are now withered but still dominant (type *Agrestis*)

Common:

Teucrium gaphaleodes val.

Artemisia valentina Lamk.

Incidental *Delphinium peregrinum* L.

Incidentals.

Delphinium peregrinum L.

Plumbago europaea L.

Echietropium europaeum

Balleta foetida

Lavandula stoechas L.

Teucrium polium L.

Tribulus terrestris

Atractylis humilis

Chicorium intybus

Chenrillia juncea

Micrenschel

Micre lenchus salmanticus

Scelymus hispanicus

Xanthium spinosum

In the grain - fields are planted in ridges and irrigated. (October)

Gleditsia Toledo



Adm. L. y. Oliver
opposite Toledo

On the granite hills of NEW CASTILLE
Dominant.

Macrechlea temacissima
Thymus vulgaris

The common roadside tree is *Gleditsia*
triananthes.

The only bush on the granite rocks is
Rhus coriaria. L.

In the streets of Toledo in Cetebre
Rumex Patentia L.

-in-gardens--
I saw jugs 10 feet high used in stead
of wire barrels. 5 (see photo Talavera)

September 26

BOTTOM

Dominant;

Ballota foetida (in bottoms)

Slopes;

Stipa temacissima (top dry)

Retama sphaeroides

Ballota foetida

Lavandula spica

Further back from the city, the original
formation, that is *Quercus Ilex*, all trimm
ed, low, for making charcoal. In a moist
spot a wild *Ficus*.

On rocks of oak forest

Brachypodium ramosum Ret.

Asparagus acutifolius

Cairis alba

Rhamnus lycioides

September 25,

Toledo; opposite bank of river.

Bare granite hills.

Stipa temacissima (spots)

Retama sphaeroides

Ruta montana L. (in spots)

Daphne gnidium

Plumbago europaea

Ballota foetida

Mentha rotundifolia

Thymus vulgaris L. *Microlepus sal*

Microlepus salmanticus



Here are olive groves. A few *Quercus* *Ilex* have edible fruits; probably all grafted. A single *Pinus pinea* is planted for its fruit. One spot *Cynatia*. Along river *Ulmus*, *Populus nigra* and a little *Tamarix*. Where water is available *Ulmus* is planted on the wayside. Elsewhere *Gleditsia* & *Robinia*. Rare Maize for cattle. Alfalfa *Arundo Donax* cult. For coarse brooms they employ *Macrechia tenacissima* and *Micrelenchus salmanticus*. All crops excepting olives need irrigation.

On certain flats the only plant cattle have left (cropped closely) is *Salsola vermiculata*.

At Telede seen also:

Dianthus lusitanicus Bret.
Delphinium peregrinum
Malva
Malva sylvestris
Anagallis arvensis
Ferula
Lavandula spica L.
Resmarinus
Verbena officinalis
Ac. hillea millefolium
Andryala integrifolia L.
Lactuca ramosissima
Phagnalon
Pulicaria hispanica

---MADRID TO CORDOBA---

Nov. 3, 1915

The Mancha is a Tertiary Lake bottom, Cliffs and beds of a higher Tertiary plateau of Marls (much eroded).

In the valley of the Tago are fine avenues of *Platanus* and *Ulmus*. Lots of strawberries. Hills more or less olive s. l.

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In spots the railroad has planted *Gleditsia triacanthos*.

Association south of Aranjuez.

Macrechlea tenacissima

Atriplex Halimus

Retama sphaeroides

Artemisia valentina Lamk.!

Throughout the Mancha (red soil) clear into Andalusia grain is the staple. Olives are scattering & vines rare. In level spots in the Mancha, I saw little uncultivated land, excepting in some salt-incrusted sinks. An occasional Tamarisk. Along the fields, a *Prunus* or *Crataegus* is planted.

As we reach the first windmill, the growing of Safran becomes an important industry. These fields are now in bloom and present gay patches of color in the dismal brown of the plain.

Throughout the Mancha dominant:

Dwarf *Rosmarinus*

Rarer

Retama sphaeroides

Cistus -(*ladaniferus*)

crucifers

In spots planted:

(rare *Pinus sylvestris*)

Gleditsia triacanthos

Cupressus

Ulmus

Then we pass spots with extensive forests of *Quercus ilex*.

Rosmarinus ! (dwarf)---

Cistus -(*ladaniferus*)

Balleta foetida

Daphne Genkium

At Manzanares, for miles, young vineyards.

-----Outliers of the Sierra Morena.-----

Chapparal & olives!! , with irrigated walnuts.

103
The Sierra Morena itself is more or less covered with forests of Quercus Ilex.

Resmarinus (dwarf)
Cistus (ladaniferus?)
Helichrysum stoechas
Creeks ---- Fraxinus

-----Passe Depennaperres-----
Yellow deciduous Leaved (Acer? Fraxinus?)
Creek.
Fraxinus!
Salix.

Many trees are yellow or red with the beautiful foliage of Vitis. A few wild figs.

Cistus now begins to be abundant?
(Lower down seem to be 2 Species?)

St. Elena (A few patches of olives)
We are in Andalusia! Every creek shows Nerium Oleander, and with it appears Pistacia Lentiscus. Cistus is common. A little (Retama Sphaeroides *) is still present.

Young grass
Asphodelus albus (sprouts)
Lavandula

Small yellow Composites (patches)
The formation is Buntsandstone.
Olives are grown to the tops of the hills (a few are wild) Pistacia Lentiscus is now vigorous and a dominant. The scene reminds me of Alcadia. Some Tamarix. Agave grown.

-----VALLEY OF GUADALQUIVER-----

The neighboring hills are (tertiary) covered with grass. We see wheat fields and miles and miles of splendid olives. Irrigated spots bear apples, pomegranates, cherries, grapes. One farmer had 10 acres of irrigated Populus.

Elsewhere are stretches of forest

104
of *Quercus Ilex*. Dense undergrowth *Pistacia*
a *Lentiscus*, *Oleatis Flammula*, and some *C*
Cistus (albidus).

The river valley offers *Populus*
and *Tamarix*, covered with the beautiful
red leaved vines of *Vitis*.

-----Gerdeba to Sevilla-----
Nov., 5, 1915

The valley and adjoining hills
are almost all cultivated; although some
fields are left to the horses and cattle!

The staple is wheat; but also *m*
miles and miles of olive groves, climbing *t*
to the top of the hills. Although younger
trees the scene resembles *Majorca*.

Oranges groves (irrigated)
are frequent.

Along the river we see grapes, app
les, pears, pomegranates, etc. Some
avenues are lined with *Eucalyptus* and
Robinia at stations (both poor). Some
Milanthus; *Morus*, *Cupressus*, *Opuntia*, *Agave*.
One *Pinus pinea*. *Arundo Donax* planted.

The "gallery" is composed of
Populus (alba), dense thickets of *Tamarix*?,
(sometimes real trees), reed like grasses
and rare *Fraxinus*. Only one *Salix* was
seen, and that in a tributary stream.
gully. Although *Merium* already occurs 74
kilometers east of Sevilla. (Here also *Chama*
erops) and then in sparse specimens along
some tributary streams, it is exceedingly
rare in the Guadalquivir valley.

In today's traject, traces of the
vegetation are occasionally seen. It is *Quercus*
S Ilex. The rancher plows all undergrowth
down. (*Retama sphaerocarpa*) still occurs;
but the dominant (and of enormous size)
is *Pistacia Lentiscus*. The landscape ressem
bles my picture of *Alcudia*, *Majorca*.

At Palma del Rio (74 kilometers
east of Sevilla for the first in Andalusia)

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Andalucia Chamaerops humilis (with first
Merium) Then gradually the palm Dominate
s in the landscape.

This low brush covers the ground
in exclusive growth; although occasional
Pistacia and Quercus Ilex may occur,
and Daphne Gnidium is not rare. It is all
pasture -land.

Along the R.R. we see ore and
cork piled up for shipment.

-----SEVILLA-----

Nov., 6, 1915

A boat from Greece was loaded with
Pine planks.

Cupressus
Cemifers (wretched, too hot)
Phoenix dactylifera (fruit)
Pritchardia Filifera
Ficus (indica?) 4 feet
Platanus
Acacia
Robinia
Oranges!
Schinus molle
Eucalyptus
"Gevillia Robusta"

-----ALCAZAR-----

Magnificent gardens with its fine
orangers along the walls, its tall Phoenix
dactylifera, its Buxus hedges, a 4 foot Mag
nelia grandiflora, some fine big Juglans ni
gra.

Bambusa
Cupressus
Pinus halepensis
Taxum edium distichum
Schinus molle
Grevilla rebuzta

SEVILLA TO JEREZ

NOV. 11. 1915

Closer some large orange groves, apparently without irrigation. Rare *Pinus halepensis*. (probably planted). Hundreds of acres are planted to *Pinus maritima*. (pine).
 Original stand undoubtedly *Quercus ilex*. Undergrowth *Cistus*, (*Thymus*), and the dominant which covers great stretches *Chamaecreps humilis*. *Pistacia* relatively rare; sometimes wanting for miles. Rare is (*Retama sphaeroides*). More abundant is a "Bunch grass" (*Brachypodium*?) and *Daphne gnidium*. (*Salicornia frutescens*) covers the bottoms. Tamarisk cheese moist stations.

Mandragora microcarpa Bert.

(*Colchicum*?)

Yellow composite

Asphodelus fistulosus

(*Lavandula*)

Arundo donax is grown; and we see big groves of *Eucalyptus globulus*.

This the common roadside tree. The hills are planted to olives; the flat region to wheat. Great fields resembling those of California. However all are plowed with oxen; sometimes 30 spans follow each other.

Vines are rare until we approach Jerez, where they cover thousands of acres of low hills. The best wine is produced by a soil formed by a sort of decomposed chalk or friable limestone. Rare almonds, and figs.

In the parks of Jerez.

Palms (magnificent)

Phoenix canariensis

Pritchardia filifera

5 (rare fan palm)

Cupressus sempervirens!

Araucaria imbricata

Pinus halepensis

Taxus

Taxus

LIST OF PLANTS

Ulmus
 Celtis australis
 Quercus ilex
 Populus
 Magnolia grandiflora
 (Roses in bloom)
 Laurus nobilis
 Gleditsia triacanthos
 Robinia pseudoacacia
 Oranges
 Limes
 Hibiscus Eucalyptus
 Eucalyptus globulus
 Hedera Helix
 Solanum (white climbing)
 Salvia splendens

The younger olives, here, have the trunks protected by banks of earth.



I visited the wine-cellars and sampled sweet Pedro Jimenez and other brands. Jerez is worth \$Dollars 6 a gallon, and more. In kegs of 31 and 15 gallons. The cooperage is probably of Pseudotsuga Douglasii, decorated with a amenia. All cellars are above ground and well ventilated. Jerez is noted for its fine horses. Zapata breeds the most showy animals. There other breeders; even Demecq has a stud of his own. The time to visit is during the fair, in the first part of April

-----JEREZ TO CADIX 66666-----

Nov. 12, 1915.

Vineyards only on sunny hillsides. They avoid clay or sandy ground. In the valley of the Guadalete is a large sugar factory. Probably beets, although I saw none. Nothing but olives on the hills and Pasture and wheat below. Possibly the Guadalete is navigable and sugar cane is

brought up. Around Cadix and Jerez, Oranges are wanting and olives get rarer. The hedges now are of *Opuntia*. Along the track yellow composites and a "*Colchicum*" like (eel) are seen.

Moist bottoms are covered with Tamarisk. I saw no *Chamaecreps* until just before Jerez. Old Sand dunes of the coast are covered with *Pinus pinaster*. Undergrowth: *Limnium* *monopetalum* Beiss. and perhaps Tamarix.

For miles the bottoms now show *Salicornia frutescens*.

In Cadix the same trees were or less as at Jerez.

The walls of the wharf offered me *Frankenia hirsuta*.

Cadix has a cachet of its own but it is not an interesting city. Streets are narrow, but straight and at right angles. All alike. The houses are 5 stories high, without ornamentation. (oriental influence) white washed and with many Miradores. The entrance halls and stairways often are of Italian marble; and the doors of massive Mahogany. There have been riches here.

The glory of the city is the seawall which encircles it. This is planted to a beautiful park. Although exposed to the winds, the vegetation is rich. The most striking are *Pritchardia filifera*, a big *Ficus* (indica) and particularly the hundreds of fine *Phoenix canariensis*.

Other parks abound; all rich in trees and shade. The avenues usually lined with *Gleditsia triacanthos*, and some *Platanus*, with a tree I do not know.

Sometimes a fine *Araucaria imbricata* towers above all. *Robinia* is not rare. A few *Pinus halepensis*. The flower beds are raised in Spanish style. These bear either a lawn of very coarse grass, or usually masses of *Hedera*. Sunken beds are filled with violets (style of Prado)

Casuarina
 Cupressus
 Pinus halepensis
 Taxus baccata Populus Quercus
 Populus
 Quercus Ilex
 Celtis australis
 Ficus indica.
 Agave americana
 Canna indica
 Bougainvillea
 Mirabilis
 Rosal
 (Berberis)
 Magnolia grandiflora
 Laurus nobilis
 Grevillea robusta
 Mimosa Polinciana
 Melia acederach
 Evonymus
 Schinus molle
 Abutilon
 Camellia
 Eucalyptus globulus
 Arbutus unedo
 Diospyros kaki
 Plumbago capensis Ligustrum
 Ligustrum japonicum
 Nerium Oleander!
 Nicotiana glauca Salvia splend
 Salvia splendens Veronica Lind
 Veronica lindleyana

A very fine Dracaena Drace grows in the Botanical Gardens. Otherwise there is nothing of interest to see in there.

We follow the peninsula along the coast; south towards San Fernando. On the hills we see Pinus pinea and a rare Quercus Ilex. In the distance they are covered by olive groves. In San Fernando a few oranges.

This

This region of dunes and salt marshes shows dense green patches of Oxalis cernua under the Salicornia Fruticosa which dominates everywhere.

MARSHES.

DOMINANT.

SUAEDA fruticosa Forsk.
Salicornia fruticosa
Limonium monopetalum

ABUNDANT.

ATRIPLEX Halimus L.
- portulacoides L.
Frankenia pulverulenta L.
Spergularia pungens Kit.

Dunes.

DUNES.

Dominant.

Amphiphila arundinacea Link.

COMMON

Juncus (meist)
Spergularia pungens Kit. (bottoms)
Panorhiza maritima
Atriplex Halimus
Silene nicaensis All.
Ononis reclinata L.
Euphorbia Paralias L.
Tamarix (meist)
Eryngium maritimum
Solanum se damacum
Plantago ceronepsis L. (Bottom)
Echallium elaterium Rich.

-----CADIX TO SEVILLA-----

by boat

JUNE 15. 1916

The eastern shores of Cadix bay
are occupied highly cultivated fields
and forests of Pinus-(pine)

MOUTH OF GUADALQUIVER
TO SOUTH.

A high bank covered with vineyards
clear to the water's edge. A few
Olives and Cupressus are seen. The
place is a summer resort for the
interior.

TO NORTH.

TO THE NORTH.

As far as the eye can reach the coast is formed by sand dunes, with more or less woods of *Pinus pinea*. Near the water's edge this gives place to a tallgrass (*Psamma* like) and some leguminous bush.

Along the river, *Limoniastrum menepetalum* Boiss. is common the pines.

River banks and islands, are covered with *Phragmites*. The few *Tamarix* are probably planted. The low plain spreading out for miles, is covered with *Salicornia frutescens* and allied succulents; but amongst which grass offers good pasture. Many herds and hundreds of bulls are seen.

All the latter candidates for the bullring. A few miserable, thatched huts are the only habitations. In the distance low rolling hills bear the typical olives.

As the soil gets higher and better cultivation is seen. Grain! A patch of

maize! Now the gallery shows a sprinkling of *Populus*, *Salix* and *Tamarisk*. The houses are better: then we pass a villa surrounded by a large orange grove. Wheat fields dominate later on. They are white with *Convulvulus (sepium)* and a big *Umbellifer*. *Eucalyptus* planted around houses; orange groves are more numerous. Nightingales are singing.

-----SEVILLA TO LOS MALLAS(-----

June 18; 1916

Triana---many big kilns. A little of cerreal here a sign "*Esquella Taurina*". At stations Merus.

CROPS.

Hills.

Fine olives, well cultivated.

Staple.

Wheat (good stands)
Harvest just commencing.

- 2 nd Vineyards.
 - 3rd , Maize.
 - 4 th a few garbanzos
- CREEKS.

DOMINANT.

- Herium Cleander
- Common
- Tamarisk
- Rare .

Fraxinus
Little brush. Open stands of Quercus Ilex.
and occasional pines.

MONTE BAJO

DOMINANT

- Cistus ladaniferus
- menpeliensis
- Quercus coccifera
- Rarer
- Pistacia Lentiscus
- Daphne gnidium
- Genista? (Retama?)
- Ferula communis (conspicuous)
- Ceris menpeliensis

Between Sevilla and Rio Tinto no
Chamaecreps was seen (destroyed). After that
it is common.

Along the R.R. track -- Telpis
barbata, was the most conspicuous and
abundant Plant.

We note.

- Papaver Rhoeas
- Hypericum perforatum
- (Eryngium) A beautiful big blue
- Erythraea grandiflora Biv? (r; R;
- Convolvulus sepium
- "Verbascum"
- Behium plantagineum
- Scabiosa maritima
- (Cirsium) pretty blue!
- Helichrysum stoechas
- Scelymus hispanicus

A collection cannot be placed. It comes
South of or at LOS MAILAS.

Agrestis alba (64)
Cynesurus echinatus (51) Helo
Helcus lanatus (L.) (50)
Sedum album L. (63)
Pistacia lentiscus (17)
Hypericum perforatum L.
Cistus crispus (62)
Calamintha adscens (66°)
Thymus mastichiana L. f. -"
(Viburnum tinus)
Andryala integrifolia - L. (66, 44°
 (25, 40)

A false timetable makes me lose a day. Had to stop over night in Los Mallas. This is a little old andaleucian town surrounded by roman walls. All houses are whitewashed. A dreary place. It lies on the banks of the Rio Tinto.

The stream is deep red in color. Probably iron oxide, perhaps with a trace of copper. The latter however, cannot be abundant as Nerium sends its roots down into the water. However Nerium is not so abundant in the along the main stream as it is in the tributary vallies and even on the adjoining hillsides. A pretty brook of sweet water common, has its banks ablaze with Nerium.

Near the river side there is some Chamaecrops. It is a dominant on the surrounding hills. A few feet from the river *Rhamnus oleoides* L. is common. With it was some *Cistus menspekianensis*, a little *Retam* a *sphaerocarpa*, and a little *Asparagus albus*.

From the river bank to the top of the hill, beautiful *Statice sinuata* L. is common.

COMMON IN VALLEY.

Silene portensis
Spergularia rubra Pers. (red flowers)
Mentha pulegium (most higher up)
Echium plantagineum L. (rare)

Rarer

Retama sphaerocarpa & other
"Genista"-like plants

Patches show a pure stand of *Lavandul*
a *stoechas*.

Seen *Cistus ladaniferus* mingles wi
with the *Cistus monspeliensis* sand,
higher up covers thousands of acres in
pure stand.

Then appear.

Incidentals.

Rubus

Pistacia Len tiscus

Rhamnus Oleoides (roets in water)

Helianthemum halimifolium Willd.

Daphne gnidium

Erica arborea

Erica tetralix var? *glandulosa*
(rare()) in bloom

Phloxia purpurea

Rare

Pteris aquilina

Wild olives

Whilst *Andropogon hirtus* covers the
ground, with other grasses? *Holcus*
lanatus; *Agrostis alba*, *Cynosurus echinatus*
Compositae (probably *Andryala ragusina* mine
r & *Telipis barbata*, *Thrinacia*) are common.

The gullies, clear up the mount-
ain side are lines of blazing red. *Nerium*!
The glory of these hills! As said, the
oleander, although present, seems tedious-
like the proximity of the river water. It
is vigorous, however on the R.R. bed.

Throughout the Rio Tinto valley,
Myrtus communis abundant and in bloom

As we reach the higher crests,
pine woods appear, but the sprouts would sti
ll indicate vocation of live oak.

Chamaecreps is everywhere and goes
to the very top at 1700 feet.
Brush.

Rumex induratus Boiss!

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(Retama group) rarer
Cistus ladaniferus!
 - *menapiensis*
Myrtus communis (rare)
Erica arborea

Where man has decided to reforest, he has planted and-pl-- Eucalyptus & pines. Cork oak would have been wiser. At the mines and at Zalamea, Robinia pseudoacacia lines the streets. The sulphur fumes do not seem to affect it. With this exception, for miles around, all vegetation has been killed.

The original forest stand of live oak has of course been cut out.

Merium resists the fumes well, and goes high up in the gullies. Otherwise only Chaeturus fasciculatus Pers. & Spargularia rubra Pers. survive. As can be surmised, close to the smelters nothing can live.

To the North a dump showed abundant Erica tetralix var. glandulosa. and a single Cistus ladaniferus.

I was told in Falun, Sweden, that history has shown, that no epidemic could survive the smelter fumes. Here however, Malaria exists. A staff of 20 Spanish doctors and 5 English are employed by the mine. One village is inhabited entirely by the English.

Rio Tinto is a great enterprise. Five big open quarries, and much underground exploitation, are in full work. In the open cuts, a series of terraces bear, each one, a R.R. track; steam shovel and train of cars. The miner blasts the rock and the scoops lead the ore into the cars on the terrace below. The entire mountain for many miles is a mass of ore. Enormous!

The blasts are set off at noon time. A canonade ensues. Drilling is by Churn drill lifted by a donkey engine; but directed by man.

At present little ore is roasted. The copper is extracted by lixiviation. All the poor ore is exported for the manufacture of explosives. (Sulphur)!

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The entire top of the ore body is a mass of hematite, which is hauled off to the dump. The quantity is enormous. Some day these dumps will yield a fortune in iron. The mine owns 14 square kilometers of land, 50 miles of track are in use.

The old town is built on the ore. Now the houses are quarried off with the ore. I left the same evening for Salamea. Soon we get out of the sulphur burned mine lands. Immediately farms appear, with olives and scattering pines and oaks. At first the native vegetation is only *Nerium* & *Chamaerops*. Soon, however, *Cistus monspeliensis* & *C. ladaniferus*, appear.

Salamea is a pretty, clean, little place, with some interesting grated windows. Some of the surrounding hills are covered with oak woods. In the distance is a dense forest of young pines (planted?). Otherwise the region is well tilled. Oranges grow here.

-----ZALAMEA TO HUELVA-----

20 June, 1916

Scattering woods-- *Quercus Suber*-- with Monte Bajo. As we near the "Ink" river, lower down, are dense stands of young pines. Some of the oak woods are beautiful. A regular park with carpet of grass; *Andropogon hirtus* L. & *Agrostis pallida* Link.

We note also some *Umbellifer* and a few *Chamaerops*, but no brush.

In general, however, there is a Monte Bajo under the oaks.

Cistus ladaniferus!
--*monspeliensis*!

Incidentals *Lavandula stoechas*
Pistacia lentiscus.
Myrtus communis
"Genista" group

RARE.

(Cistus crispus)

Phlox purpurea

As usual we may class the entire region, as a cut out oak forest, with Monte Baño; in which one species or the other predominates, sometimes pure or mixed. Pteris aquilina is seen in some moist bottoms.

In the pine woods, lower down, the flowers of the dominant Helianthemum halimifolium Willk. are a pretty feature. This is associated with Erica argera, and Cistus ladaniferus, at a still lower altitude is Ceris Monspelienensis. Here for the first time note Phylleria angustifolia, and (Arbutus?) (is? Viburnum tinus)

Along The R.R. track we again see our acquaintances of the andalucian plains; Andryala ragulina minor (ill) Lgo.

Telpis barbata Gaertn.

Thrinacia hirta Roth.

S. ex

Daucus Carota

Avena fatua

With them are the usual Cirsium and a rare Asphodelus.

As usual, all gullies are red with Merium.

Valverde.

Pritchardia filifera

Araucaria (imbricata)

Oranges, Pomea;

Eucalyptus in the forest.

With the plain olives are again dominant but figs, grapes and almonds are grown. The immense grain fields are ready for the reaper. A patch of Garbanzas was yellow with an Umbellifer.

We note.

Andrepegon hirtus

Olema

Cnemis procurrens var. vulgaris Wallr.

Daphne Gnidium

Geris menspeliensis
Erythraea grandiflora
Verbascum
Scelymus hispanicus.

In the moist delta of the Rio-Tinto we still see *Chamaecreps* & *Cirsium*. However all higher spots are covered with *Linum catharticum monopetalum* L.;

All the way from Zalamea to Huelva the stations showed big piles of ore. All of the same as at Rio Tinto. Only in one spot it seemed to be a mineral of iron. I was told that the peasants had destroyed agricultural machinery imported by a neighbor.

HUELVA

Bustling little business town. Unusual activity for a Spanish place. Still they are not used to strangers. After sundown the cafes fill the streets with their chairs. There must be money as the resorts are filled until midnight; but the noise kept up all night. Somewhere a Concertina kept asqueeking until morning; probably an all night dance for sailors. At 3 a. M. Cartas announced the advent of dawn, just like Paris.

Many houses have the facades of tiling. Generally they are pale blue, with trimmings of white tiling or of buff brick. Some pretty effects are thus attained.

The life of the place is the ore shipment. Rio Tinto of course, having the lion's share. Its immense iron mole (post card) permits continuous loading. The open bottomed cars run directly from the mine to the ship. The wharf has 4 tracks, one above each other. Three big steamers (1 Japanese, & 2 English) were loading at the same time. Several steamers were awaiting their turn outside.

Another immense wharf, with numerous derriksen, is to the north of town. Then across the river another big wharf runs

-----HUELVA to JABUGO-----

June 2nd 1916

R.R.

We pass mines. Every station has its pile of Rio Tinto ore; and every train is loaded with it. At 77 kilom. are springs and a hotel. At 32 kilom. we pass a stream that has the same muddy water as the upper Rio Tinto. Again the glory of the region is the *Nerium Oleander* of the gulches. This plant stays with us, far up in the Sierra Aracena. There, a heavy growth of oaks takes its place. Beyond Jabugo, once more on open slopes, sees *Nerium* appear on most river beds. On the banks of the Guadiana, it goes clear to Merida. However north of Jabugo, the bush has lost its vigor, and we may consider the Guadiana as the northern limit of the plant. And *Salix* already, *Nerium* is generally wanting.

Chamaerops (see comments the south) practically disappears 12 kilom. north of Huelva. A last isolated stand, was seen at kilom. 45.

Cercis sempervirens, common below disappears with the Sierra Aracena.

A few groves of *Pinus Pinaster*, on the lower hills, are probably planted.

(*Retama sphaeroides*) at first is sparse then more or less common.

DOMINANTS.

Cistus sempervirens

- *ladaniferus*

(mixed or single)

INCIDENTALS.

Myrtus communis P.

Pistacia lentiscus.

Daphne gnidium

Lavandula stoechas to Caceres)

Phlomis purpurea L.

Sprouts of *Quercus ilex* (ballo ta?) Betray the vocative. Today the oaks have been replaced by *Cistus ladaniferus*. Gradually oak trees come, until finally

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we have a dense wood of *Quercus Ilex* (Ballota) and *Quercus suber*. Here, occasionally may occur a wild pear.

At 65 kilom. *Andryala integrifolia* is still abundant.
Greek shows.

Andropegen hirtus
Rumex induratus Boiss.
Clea (wild)
Daphne gnidium
Lavandula stoechas
Andryala ragusinavar. minor Lg.

The "Genista" tribe is common. *Retama sphaerocarpa*, *Genista lanuginosa* and others; but usually they are subordinated in the association. (*Retama sphaerocarpa*) (white flowers) becomes more common towards the Guadiana basin.

Rumex induratus (dry)
Viburnum tinus
Cistus (crispus) rare
Elichrysium stoechas

"*Cirsium*" noticed everywhere in Andalucia, goes into Estremadura.

SIERRA ARACENA

Oak park (California Sierra foothills) with grass. In moist spots *Pteris aquilina* rare *Adiantum Capillus Veneris*.

Rubus is common in the hedges. Weeds; *Terilis helvetica*

Daucus Careta
Scabiosa maritima

Nearer Huelva, lots of olives. Later on figs, mulberries; *Eucalyptus*, *Robinia*.

JABUGA 6666

(46-750)

Mountains are now higher and meister. *Castanea* can be grown. At the station a lot of donkeys (with only a sack as saddle)

awaited passengers. I took the stage.



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for Aracena. I was up with the driver; it was hot as blazes, so I put up my umbrella. The driver had his hands blistered by the heat. He was a jolly chap. We met a pretty girl on a donkey. "Don't fall off, my seoul!" cries he. She gave him a cold stare!

We start to climb; a few olives, then for miles a mixture of *Quercus* and (*baleta*?) and *Quercus suber*. The latter most abundant.

UNDERGROWTH.

DOMINANTS.

Cistus (albidus)—sparse

Pteris aquilina

Incidentals

Erythraea grandiflora Riv.

Lavandula stoechas

Scabiosa maritima

Andryala ?

Various composites *Thrinacia*?

Telpis?

We cross to the north slope, with its abundant moisture. Every ravine has a beautiful spring. Some pretty brooks are passed, showing an occasional *Salix*. Some bottoms have *Populus* as wood-lots. The landscape is now enchanting!! Nightingales are singing.

Irrigating brings a vigorous plant growth. We pass regular grass patches and everything is green. Many plots of grain, still green, grew under the trees. The staple now, for miles and miles, is *Castanea*?. Most of the trees are young averaging 2 feet in diameter. They are the most beautiful, vigorous, beautiful and verdoyant trees of their kind that I have ever seen. Older specimens, with trunks 3 to 4 feet and more in diameter were noticed.

Some dry knolls are planted to olives. We pass many villaged. *Alerose* is most picturesque. Cherries (trees one & one half feet in diameter, but poor small

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fruit) apples, pears, potatoes, a few almonds.

In this region are the most noble walnut trees I have ever seen. Many are 60 feet high and with trunks 3 feet in diameter. One old hollow chap on the bank of the creek was fully 7 feet in diameter. Gardens.

Casuarina
Cedrus
Magnolia grandiflora
Platanus orientalis Acacia
Acacia Nerium Oleander
Nerium Oleander

Avenues are lined with
Juglans nigra, Gleditsia triacanthos
Robinia pseudacacia
Platanus orientalis

In these groves of chestnuts, clear to Aracena, we hardly notice the few oaks of the native flora, the stand is so dense. As undergrowth only a little Cistus (probably albidus is seen. In waste spots, sprouts of Quercus Tozza, prove that this side belongs to the vocation of white oaks, and not (like these dry slopes) to that of the live oaks.

MAQUIS

Pteris aquilina
Cistus albidus!
- menspelienis (rare)
Helianthemum ocinifolium Lam.
Beautiful!
- guttatum
Sarcocolla ericarpus Bss.
Pistacia Lentiscus
Erica arborea
Lavandula stoechas
Lonicera
Viburnum Tinus
Helichrysum stoechas

ROADSIDE.

Briza maxima
Cynurus echinatus
Rumex induratus Boiss. (wall)
Helleborus
Papaver Rhoeas
Vicia
Linum (marbonensis?)
Euphorbia Characias
Malva retundifolia
Hypericum perforatum
Cistus crispus
Helianthemum ecimifolium Lam. (yellow)

Hedera helix (wall)
Anagallis arvensis
Erythraea grandiflora Biv. (Pink)
Echium pustulatum Sieb.
Borragia officinalis
Brunella vulgaris L.
Phlox purpurea
Teucrium
Teucrium frutescens fruticans
Digitalis
Campanula Rapunculus L.
Jasione perennis L.
Leucanthemum pallens DC.

An open hill, amongst the Castanea groves

Pteris aquilina
Quercus Ilex
Agrostis Castellana Boiss.
Briza maxima L.
Aperagus albidus
Rumex induratus Boiss.
Iberis contraata Pers.
Genista tridentata II
Sarethamnus eriocarpus
Rosa montana L.
Malva retundifolia
Helianthemum ecimifolium Lam.
Thymelaea hirsuta Endl.
Daucus carota
Erica arborea
Erythraea grandiflora Boiss.
Lavandula stoechas



Teucrium Pelium
Viburnum Tinus
Jasione perennis Lam.
Scabiosa maritima
Achillea ageratum L.
Helichrysum steechas L.

Near Aracena, the cracks of the
 rocks of the reefs, are white with *Sedum*
Album L.

Here I also note
Crataegus
Astragalus lusitanicus Lamk.
Cistus ladaniferus

With Aracena olive groves appear
 again, as we have passed to the dry southe-
 rn slope. Big groves of *Quercus ilex* and
Quercus suber alternata (Photo)

To the south of town lies a dry
 bare hill.

DOMINANT.

Phlox purpurea
 INCIDENTALS

Pteris aquilina
Agrostis alba
Briza maxima (dry)
Paronychia argentea Lam.
Antirrhinum majus L.
Delphinium peregrinum
Ruta montana L.
Euphorbia characias
Malva rotundifolia
Hypericum perforatum
Cistus albidus
C. - monspeliensis *Teucrium*
Teucrium Pelium L.
Thymus Mastichiana
Scabiosa maritima
Jasione perennis Lam.
 Small composites

In one big grove of *Quercus suber*
 I collected true *Quercus ilex*. (Photo)
 Aracena is a quaint andalusian
 village - (photo)



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Today I noticed many tracks of snakes. They are said to be harmless; and the viper is rare. *Aracoma* region

The entire *Aracoma* country is a great pig raising country.

-----JABUGO ~~SA~~-ZAFRA-----

22 June, 1916

The region is an open park like stand of *Quercus ilex* (ballota?) and some *Quercus suber* with pasture and sometimes grain underneath. The live-aks are generally stunted as the tops are cut by charcoalburners.

MAQUIS.

DOMINANT.

Cistus monapeliensis

ladaniferus

Common *Rumex induratus* (open spots)

Retama sphaerocarpus (

Sarcothamnus eriocarpus Bas (

(white flowerz)

Pistacia lentiscus (sometimes 10 feet high amongst the granite boulders)

Lavandula stoechas L. (open spots)

Rhamnus purpurea (dry hills)

Helichrysum stoechas L.

ROADSIDE;

Hypericum perforatum

Daucus Carota

Anthemis mixta L.

Some moist bottoms are given over to *Populus* cultures. Olives, almonds, figs.

At first rivers show some *Nerium*.

Nearing Zafra it disappears, but is again seen on the Rio Guadiana.

-----ZAFRA-----

It is Corpus Christi. Big procession this morning; and the streets are strewn with *Junco* and *Junco* pease. Many peasants in town; but most of the men are busy with threshing in the



Merida, Yucatan, Mexico
 (view of Merida)
 (view of Merida)



Merida, Yucatan, Mexico
 (view of Merida)
 (view of Merida)

suburbs. The sheaves are hauled in on carts. The threshing is done by a sort of disk harrow (see photo Merida); or more generally by stock running loose about. Pace is a walk. Never the vigorous trot of Malaga.

A bum bullfight was pulled off for the occasion. Cows! No horses. One chap got ran away, and was hecked, relled over etc. One matador struck the victim 6 times before killing him. Dared cruelty! I notice a boy playing with a live bird, cruel.

During-a-young-a-hap
 During the bullfight a young chap spectator, jumped in and did good work. Another followed his example and was marched off to the calaboose. They there cut off his celata as punishment. The last cow was a beautiful animal it made me sick.

The peasants carry their cigarettes back of their ears. The hotel is an old seignorial residence. The big is as cool as ice and is used as a dining and a living room. It has a glass skylight, but with a sliding canvas shade under the glass. This is moved by cords; but the shades run on wires strung 2 feet apart. Throughout Andalusia many streets have these awnings from one house to another; during the daytime.

In the evening, every doorstep was occupied by one or two servants speculating. Our hotel step was entirely covered by them.

There is a fine old medieval castle at Zafra (photo) Street scene (photo)

The water must be alkaline as I had a diarrhoea all night, which weakened me.

At the station O I had a taste of the shiftlessness of the people. Couldn't get a ticket. Couldn't get my stuff checked.

Every town in Estremadura has a big bullring.

-----ZAFRA TO MERIDA-----
 June 22, 1916
 Grainfields, olives & quercus



-----*Mérida*-----
 1916, June 23
 Mérida, Yucatán, México

Ilex alternata.

Undergrowth:

Quercus coccifera

Genista group (*Sarcothamnus*, *Retama* etc)

Pistacia Lentiscus

Giatys ladaniferus

- *mespeliensis*

Daphne Gnidium

Big droves of pigs are seen. Near Mérida a few *Opuntia* hedges. With the Rio Guadiana, again Merina appears.

Otherwise the vegetation is dried up. No trees. The river has much less water than the Tajo.

In Mérida I saw some fine horses all from Jerez. A big showy stallion was bred by Zapata. A beautiful black mare was less showy but the best brute I ever saw.

Hundreds of storks big & little were perched on the Roman aqueduct. (Photo)

I saw a boy peeing from a balcony at night. An old man had what looked like leprosy on his hand.

There is a change in the character of the people here. It is more obsequious but much more annoying. They are awful curious. I don't like the character.

In the neighborhood is the Sierra de las Viboras. Baedeker says that pigs eat the serpents. threshing by "disk harrow" (photo)

-----*MÉRIDA CACERES*-----

June 23, 1916

Guadiana and all creeks show June us. A little Tamarisk along the river. Once a few *Fraxinus*. Some wheat; olives and vineyards. Vegetation *Quercus Ilex*. At first sparse, then for many miles weeds. Later on a few *Quercus suber*.

UNDERGROWTH.

Asphodelus albus (rare) *Genista*



(Genista lanuginea Spach)
 Metastema sphacroides +
 Sarcobatus ericearum
 Fimbristylis Lenticularis
 Cistus albidus (rare)
 - monspeliensis
 - ladaniferus

Daphne Gnidium
 Myrtus communis! (in bloom)
 Erica arborea
 Phillyrea angustifolia
 Lavandula stoechas!
 Viburnum Tinus

Leucanthemum pallens

Up to the watershed the forest is an open pasture land; but with the divide and descent to the Tajo valley, the north slopes bear a dense stand of

Quercus suber
 Cistus ladaniferus

- monspeliensis

Where level the wood is again open, of Quercus ilex and a little Cistus albidus. At the station of Aldea del Cano enormous piles of charcoal were awaiting shipment.

Now we pass miles of cleared wheat fields. Rocky spots bear Rumex induratus. Slopes abundant Lavandula stoechas. The harvested fields bear a generous crop of different thistles (like Majerca) and Eryngium campestre.

The granite hills between Caceres and Arroya offer little of interest. Approaching Caceres we again pass miles of open forest of Quercus ilex. With a miserable one horse cart, I covered the distance between Arroya and the R.R.

Arroya is a miserable Estremaduran place; unpeopled by tourists. Lots of "Cenleu local" remains. Interesting buildings, curious massif chimneys (photo) sticks on top of the church towers.

The people wear the old national costumes. All girls have bright scarfs sometimes beautifully embroidered,

me a good day on the road. The crowd does not push or annoy me. They just want to see; to know.

The girls are not pretty, but coarse featured.

ARROYA TO ALCANTARA 666

Sunday June 24 (25) 1916

Rolling hilly region; with big granite boulders scattered about. Some grapes producing a very strong wine. Some olives. The latter are abundant on the slopes of Alcantara, down to the river side. Some figs. Oranges in Arroya and in Alcantara.

As a whole the region we passed is dry, sterile, and sunburnt. Few weeds of *Quercus illex* were seen, but numerous sprouts give proof of the vocation. Amongst the live oaks we find a little *Cistus monspeliensis* and *Daphne gnidium*. The fields, where harvested, show the usual crop of dry prickly cactus.

Other fields offer;

Rumex acetosa L.
Convolvulus arvensis L.
Scabiosa maritima
Microleucus salmanticus DC.
Ja

Senecio Jacobaea

In many gullies we see ponds where men are fishing. The banks show *Juncus* nothing else.

THE MOST COMMON;

Lavandula stoechas (pure at Alcantara)

COMMON

Rumex induratus (rocks)

Retama sphaerocarpa

Daphne gnidium

Bolota hirsuta Bth. (Dominant on the south bank of the Tajo)

Digitalis purpurea

Cirsium sp.

INCIDENTALS;

Briza maxima

Asphodelus albus rare



Rubus
 Pyrus (1 pear)
 Cnecis precurrens vulgaris
 Cnecis viscosa (Tajo)
 Echium plantaginaceum L.
 Daucus Carota
 Teucrium Polium
 (Thymus)
 Verbascum pulverulentum
 Dipsacus (Fullenun)
 Anthemis mixta
 Centaurea albida (rocks)
 Crepis virens Vill.
 Helichrysum stoechas

Amongst granit boulders .
 Delphinium peregrinum L.
 Adenocarpus complicatus Gay.
 At Alcantara the rocks and many
 reefs show Sedum (albidum)

At the last change of horses, the
 hut of a Caminero was of interest. He had va
 valuable old porcelain and Majolica. I'm no
 judge. (Photo)

We changed horses twice
 and once we had a vicious kicking brute.
 It amused me as I sat with the driver.

Alcantara is ancient Couleur local !
 Poverty stricken . Fallen greatness.

One square is used as a bullring; as two sm
 small houses had their roofs arranged as s
 seats. Probably the surrounding balconies
 offered the choice seats for the elite.

Magnificent grattings are common. Wish
 I owned them. iron

Over the old doorways seats of arms are
 noticeable. The sign of former splendor.

The people seem dirty. However I stru
 ck a neat and pretty Fenda. A treat! I
 could not find a cafe in the town. Its hot
 and I am suffering from thirst. Yet I
 dare not drink the water; and I hate to go
 to the Casine, which is certainly here. In t
 the Fenda my landlady has a craze for
 electric light. At table we have a 100

candle power and four 18 candle. It's blinding.

In this region oldruined churches ha
have their stork's nests. Many peasants sti
llwear their national costumes. Donkeys a
are loaded wth sheaves for the threshing
floors.

Most of the poorer houses are without chimneys. The escaping smoke has stained one of these fronts black. It is a bakery. Pigs feed peacefully in the doorways. The hog is an essential part of the Estremadura landscape.

The inhabitants are rather shy; particularly the women. The latter wear huge gold filigree earrings, in the half-moon shape. Not a pretty face was seen. The type is tall, lank, lean. Poverty, dirt, and ignorance prevail.

The great sight of Alcantara, of course, is the bridge from which it derives its name. It was worth the trip.

An engineering marvel! The Tajo rushes
 as along with an awful current in winter;
 so the Romans chose a point above a jutting
 crag, which dams the river. The water of seu-
 rise is very deep and wide at this point, but
 the awful force of the current is diminish-
 ed at—

We are 7 miles from the Portuguese Fronteer, and the bridge is watched by the custom officials.

On the way back it was hot, as blazing again and as the stage was jammed full the trip was fatiguing. We picked up a lot of bull fighters, that had all the appearance of barnstormers. It was late when we arrived at the R.R. station. Stepped in a teamsters inn. The mules below had bells on, and-thau- they kept up a racket all night long. There were only two spare beds in the house. So I shared my room with a portuguese. Finally all passed off well.

Like the region towards Alcantara from here towards Casatejada the land is covered with big granite boulders. The most common plant in distribution, even in dense forests (although not always in number) is *Retama sphaerocarpa* Bss. (although some of this may be *Sarcobatus nahuatlensis*). The most abundant (where it occurs) is undoubtedly *Cistus ladaniferus*. It sometimes forms pure stands on higher ridges.

Plamencia

Undergrowth.

- Cistus mampellensis*
- Erica arborea*
- Phyllirea angustifolia* (rare) Lavan
- Lavandula stoechas* (high hills but rarely pure)

Nearing the Tajo & moister air, *Cistus mampellensis* is also seen on the slopes. Towards Casatejada the soil is sandy and large forests of *Quercus* are seen. 5) (*Q. Ilex*). As undergrowth we have a pure stand of *Cistus albidus*.

There is no question, but that the entire region here a forest of *Quercus Ilex* Only in the district just west of Plamencia numerous sprouts of *Quercus Tezsa*, 1 indicate the mingling of the two oaks, owing to colder or moister conditions. In spots, especially after crossing the Tajo, and Tietar, are some fine *Quercus suber*, but they are subordinate and may have been planted. Big stretches of live oak wood were frequent throughout the day; but only with the slopes of the Tajo are dominant. The type is that of the open park, only in spots it shows dense undergrowth of;

- Retama sphaerocarpa*
- Cistus ladaniferus*
- *Mampellensis* (rare)
- Lavandula stoechas*

...the grassspark landscape is in my opinion,
an artificial clearing. Many of the oak st
stands were once plowed land. We still see a
few grainfields, in level spots. Near Arrey
e del Puerte, for many miles, all the availa
ble soil between soil between granite bowl
ders, is plowed, and only the rare spre
nts of live oak betray its vocation.

INCIDENTALS//:

Tall grass ! Rumex-
Rumex (induratus) track)
Dianthus lusitanicus Bret.
Helianthemum ecciaifolium Lamk.
Erica arborea (localized)
Daphne Gnidium (meister)
Viburnum Tinas (rare)
Digitalis

Small composites

Meister Bettens

Pteris aquilina
Trifolium?

Erythraes grandiflora

Senecio grandiflora - Jacobaea L.

The beds of the Taje & its tributaries
are green with small, ovalleaved shrub.
5 (Rhamnus, Prunis, or Viburnum).
Daphne Gnidium is also more vigorous. We
further see a few Tamarisk and abundant
Juncus but no trees.

Beyond the Taje for miles the Land
scape is an open stand of Retama. Sphaeroid
es and grasses. With, as incidentals, Bryngium
campestre, Scelymus hispanicus and Andre
rogen. (hirtus) (on rocks).

East of this open lands, new associat
ion of Mente Baje is seen.
Retama sphaerocarpa
Genista hirsuta Vahl.
Cistus e ladaniferus
Lavandula steechas
(Teucrium Pelium)
(Thymus Mastichiana)
Helichrysum steechas

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(over)

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138
 The valley of the Tietar presents a lovely weeded landscape. Cattle are standing in the river. Here the trees are vigorous, and, *Vitis vinifera* hangs from the branches.
Pteris aquilina
Populus
Rubus
Fraxinus (2 to 3 feet)
 Large stretches of the valley are sands, covered with *Pinus*. This is certainly indigenous growth. With grow
Pteris Aquilina
Retama sphaerocarpus-oides
 As soon as the soil is firmer, *Quercus* is again dominant. This however shows some *Quercus Tozza*, *Fraxinus* and *Salix*, in the gullies. Its undergrowth is /:
 Grasses
Retama sphaerocarpa
Cistus albidus
 A high plateau west of Plasencia presents extensive olive groves.
 Planted were seen;
Casuarina
Castanea
Eucalyptus
 The usual weeds were noticed in the fields.
 I travelled first class, to be alone but the ticket inspector came and squatted down beside me all day. That's Spanish
 I am writing in a nice little inn at Casatejada. A cute little pig has just come in to see what I am doing. That's his right; he has the freedom of the house.

137
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-----CASATEJADA, (ESTREMADURA)-----
 June 27, 1916
 Left at 4 & 1/2 in the morning.
 Horse back with guide.
 For a mile or two are grainfields then an extensive forest of *Quercus Ilex*. *T. Thelandia* mostly sandy. To the south lies the beautiful castle of the noble, who owns the land for miles.

Digitized by Hunt Institute

One tree was 6 feet in diameter. It was new 9 1/2 A.M. but the lazy shepherds still had their big flocks in the corral. Or was it on account of the dew? a dozen enormous and big dogs were gording them (fierce)

We enter the hills by the d... of a most beautiful stream. The banks show the usual Fraxinus, Alnus, & Vitis. As along the Tietar, here the nightingales were warbling. Irrigation ditches filled with rippling water ran in all directions.

Some grapes are grown; but the staple crop; asthroughout the district of Lavras small pepper, shipped in the form of a finely ground powder. On walls appear our old acquaintance Rumex induratus Boiss. Erythraea grandiflora is on the wayside.

The hills are treeless. Monte Bajo

One tree was 6 feet in diameter. It was new 9 1/2 A.M. but the lazy shepherds still had their big flocks in the corral. Or was it on account of the dew? a dozen enormous and big dogs were gording them (fierce)

We enter the hills by the d... of a most beautiful stream. The banks show the usual Fraxinus, Alnus, & Vitis. As along the Tietar, here the nightingales were warbling. Irrigation ditches filled with rippling water ran in all directions.

Some grapes are grown; but the staple crop; asthroughout the district of Lavras small pepper, shipped in the form of a finely ground powder. On walls appear our old acquaintance Rumex induratus Boiss. Erythraea grandiflora is on the wayside.

The hills are treeless. Monte Bajo

- Dominant.
- Anthirrhinum hispanicum his
 - Genista hirsuta Vahl
 - Cistus ladaniferus
 - Helianthemum ecimifolium
 - Erica arborea
 - Daphne Gnidium
 - Phyllirea angustifolia
 - Erythraea grandiflora
 - Lavandula steechas L.
 - Echium plantagineum L.
 - Digitalis purpurea
 - Andryala integrifolia
 - Helichrysum steechas
 - Composite (150 & 140!)

Where moister Pteris aquilina
Mentha rotundifolia
Myrtus communis in bloom

The sprouts are always Quercus siliflora Salisbury; but south an extensive scattering of Quercus of Quercus Ilex is seen. I suspect that on these



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lower foothills *Quercus Ilex* and *Quercus sessiliflora* are mixed.

Gradually white flowered *Cistus hirsutus* appears; but the dominant in spots is *Lavandula pedunculata* Cav; with *Pteris aquilina* and (drier) *Telipis barbata* Gaertn.

Now one side of the road shows *Quercus Ilex* and the other *Quercus sessiliflora*. A rare *Ruscus aculeatus* appears COMMON.

Adenocarpus intermedius
Sarcothamnus scoparius
Malva (alcea) L.
Digitalis purpurea
Chrysanthemum Mycenis

PHOTO

Cistus hirsutus
Lavandula stoechas L.

We now approach the picturesque town of Jaraiz. Running water. Irrigation on the neighboring rich soil produces fine crops of peppers and good fruits of all kinds. Chestnut groves, olives, grapevines and in moist bottoms poplars. Grain, of course is sown wherever irrigation cannot reach. Thanks to the allmighty power of water: the entire region of La Vera is a garden. Now we see pigs sunning themselves. The chestnuts are now in full bloom. I took a picture of one fine specimen, with a trunk fully 6 feet in diameter.

PHOTO (turn page)

Brush.

Pteris aquilina
Agrostis Castellana *ferme vivipara*
is

Briar maxima
Cynodon Dactylon Pers.
Cistus hirsutus L.
Helianthemum coccimifolium Lam.
Daphne Gnidium



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(photo continuation)
Lavandula stoechas
Linaria spartea E. & L.
(Foreground *Helianthemum ecimifolium*)

In the upper region the maquis is the successor of *Quercus sessiliflora*. For miles we have a stand of scrub (pure *Quercus sessiliflora* and *Pteris aquilina*). Generally on the rocks we note:

Antirrhinum hispanicum Chav. E
Erythraea grandiflora Bss.
Crepis virens
Telpis barbata Gaert.

This oak scrub favors the north slopes. Here with it:

Lychnis cecanaria cecanaria
Desv. (rare)
Lathyrus latifolius
Helianthemum guttatum
6---- *ecimifolium*
Echium salmanticum Lag.

South slopes and dryer; in sunny open stations.

DOMINANT.

Quercus sessiliflora
Pteris aquilina

MOST CONSPICUOUS AND BEAUTIFUL
Helianthemum ecimifolium
(PHOTO. *Helianthemum ecimifolium* & in background *Quercus sessiliflora* & *Pteris aquilina* & *Lavandula pedunculata*)

(see above)

The sunny maquis offers an abundant stand of "Genistas"; of which most abundant *Sarothamnus scoparius* and hardly less so *Adenocarpus intermedius*. *Sarothamnus friecarpus* is rarer.

COMMON

Agrostis truncatula
Helcus lanatus
-- *mellis*
- *Cistus hirsutus* Lam.



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Calluna vulgaris
Helichrysum steechas

GAY CARPET.

Echium salmanticum!
Andryala integrifolia
Tolpis barbata Gaertn.

INCIDENTALS

Silene portensis L.
Antirrhinum hispanicum Chav.
Annarrhinumbellidifolium Desv.
Brassica Cheiranthus Vill.
Malva alcea L.
Teucrium Scoredenia L.

Moist corners *Digitalis purpurea* abundan
 t.

WALLS.A

Asplenium felix Femia Bernh.
 - *lanceolatum*
 - *trichomanes*
Antirrhinum hispanicum
Hedera Helix
Wahlenbergia hederacea Well.
Phagnalon saxatile Cass.

BOTTOMS.

Pteris aquilina !
Anthexantum aristatum Bas.
Silene hirsuta
Trifolium campestre Schreb.
 - *pratense* L.

Calamintha clinepedium Benth.

At Cuacos we are in a most beautiful country. Each street has a ditch of gurgling water in the center. Other wise the town is old, dirty and dilapidated. However it is of great interest and exceptionally picturesque. The overhanging stories almost close the narrow streets. The latter wind about in the most approved corkakrew fashion. (Photo & Commercial photo).

I enjoyed it all immensely.

In the church, the choir seats are these saved from the monastery of Yu Yuste. They are not as fine as these of the great cathedrals; but certainly are of value.

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Towards evening I went up, to the monastery, a mile or two away. It was the last residence of Charles 5, and his rooms are shown in detail. This apartment is about all that is well preserved. The greater and richer part of the monastery was systematically destroyed by the French. Three stories of arcades, magnificent fountains, and the rare Azulejos on the walls and floor of the old dining room, speak an eloquent language of past opulence; and artistic spirit.

A big tank of fresh, sparkling, exquisite tasting water, furnished the monks with living fish.

Shrubs and trees of all kinds Arbutus, Buxus, Ulmus, Populus, Platamus (Myrtus) and fine orange trees make it an ideal home. Still the best of all is the view. In the distance we see the dark oaks of the Tietar valley.

Noble walnut trees (One planted by Charles the 5) One walnut, vigorous beautiful and well proportioned, had a trunk 3 feet in diameter. All were full of fruit.

Nightingales and cuckoos were calling.

Today the monastery is the property of a Marques. At least nominally, so.

One must be sceptical in this matter for many fine estates, flour mills, factories Steamship companies etc. are in reality, the property of the church. The names are blinds.

Yuste is, in fact, inhabited by a dozen monks. One, wrapped in his brown cassock showed us around.

My landlord had accompanied me. At the monastery a boy of 14, came out to greet us. the child cried bitterly when my companion brought him greetings from his playmates in Cuenca. The boy said, his mother had stuck him in the monastery

Tory

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in order to make a monk of him; and in no manner did he wish to abandon the world. Peer child!

We spoke afterwards with his mother such fanaticism. A Tragedy!

All such boys who get into the hands of these "brotherhoods" become so stupid, with the continual prayer and reading of religious books, that in time, they become indifferent to their fate. They lose their resistance.

The church has influence yet. You bet!

My muleteer insisted on accompanying me everywhere. Damned nuisance!

He was a good chap all right, but I do not like to be followed.

On the return trip, by nighttime it was very hot. In the forest flies of all kinds just pestered the life out of our poor beasts. The big horse flies and a little regue just drew blood.

Casatejada is a dreary hole. It is used to be much larger; but the French destroyed it. It was the only place where I was overcharged on the trip. Still the money was not much so I said nothing.

At evening I left for Talavera, where I arrived at midnight, in great fear of not finding animal open. Luckily all the runners were at the station. So everything passed off well.

Talavera de la Reina. Dirty, sleepy hole. The old bridge is the creepiest affair I have seen in a long time. From here a fine view is had of the snow-capped Sierra Tejada.

I visited a big pottery J. J. Ruiz de Lima

Talavera de la Reina. Fine work of all kinds. Tiles are very distinctive in blue, white and yellow. The yellow gives it a rather vulgar appearance, which might be avoided. All decorating



is done by hand. Therefore one can get any design or color one wants.

He had some fine relief figures in blue and white. A virgin and child by ~~after Donatello~~ after Donatello 2/3 x 1 1/2 feet, costs 125 pesetas. There are many designs, like arabesques, angels and dragons; for decorating walls.

This manufacturer gives a watercolor drawing for dimensions supplied by artists & architects. The average cost of tiles is 100 pesetas, a square yard, at the station.

A beautiful porcelain (terra Cotta) fountain was listed at 500 pesetas. The blue tiles one sees so commonly on steps, are called Granada, and bring 50 pesetas a square yard. The edge blocks of window sills, benches etc. in blue and white, are called alizar and cost 1 & 1/2 pesetas each. They have a tail to fit into the cement to hold them.

Floors of alternate brick and tiling are called "pilaumbie & Ladrillos"/.

I also visited a factory of the immense jars used to store wine, oil & water in. (Photo) They have manufactured them as large as 6400 gallons. These that I saw ~~only~~ only held 75 gallons. It takes 6 months to make the latter.

It is all done freehand, without turning. This shows a remarkable dexterity as the curve is perfect. Little by little the clay is added. Each stery must dry before more clay is put on. The first day a string is tied around the top to support the clay. For months, then, the jars (of all forms) are stored in dark rooms.

Thus hundreds, occupying several steries, are drying. They are then put into vats to fill.

Such jar factories are numerous.

666666

-----CORDOBA TO MALAGA-----
Jan 18, 1917

From Cordoba to the Guadalquivir every available patch of land is covered by wheat (now green). 20 kilometers from Cordoba a village was entirely built of straw; walls, roof and all. The squallor is awful. Here was a little pasture and I saw horses and many pigs. At first olives are rather rare; but soon after this straw village as we climb the incline, the increase in number, and then cover all the hills. At 60 kilometers from Cordoba,

the olive extends as far as the eye can reach. The trees are usually well cultivated. Around the base of some the earth has been scraped away to catch rainwater. P. Faba and wheat are often grown beneath the olive. The soil is decomposed tertiary rock (lime, marl and gypsum.) Between Laguna Salada and Beabdilla (kil. 120) the olive is absent; but again appears around Malaga.

I note vineyards at 24 and 50 kilometers. Motilla is famous for its wine. Grapes may be abundant further back but I saw few. Around houses, almonds, figs, rare oranges (76 kil.) and Robinia. On the grove of Pinus pinea.

From the Guadalquivir to the Malaga watershed the R.R. has lined its concession, with almonds (rare Eucalyptus & Casuarina). Stretches of these nuts are dead; then again it forms a dwarf hedge. Elsewhere, if the soil is good, particularly when the adjoining fields are cultivated, these almonds are fine specimens and should yield the R.R. a good income. Thieves probably get the benefit. Near the Guadalquivir a few

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almonds were in bloom; with Malaga they are covered with blossoms.

On the Malaga plains the R.R. has planted Eucalyptus and Casuarina. The former are mediocre, the latter the finest I have ever seen.

25 kilom. an isolated (Artemisia) Guadalquivir to Guadalupe 355 Guadalupe hills of 355 meters, and a plateau. Original vegetation destroyed. DOMINANT (but sparse) DAPHNE GNIDIUM.

Vegetation, Quercus ilex. Isolated patches of scrub (20, 57, -90) - 1 kilom. At 80 kilom. a few fine oaks, I suspect planted Quercus ilex. Quercus coccifera is present, but rare, only less - a little more abundant at 80 kilom. & near Beabdilla. (120 kilom.) The region between Laguna Salada & Beabdilla, thanks to its rockier limestone, is practically the only spot where a few native patches exist.

Mediterranean type.

Quercus ilex
- coccifera
Pistacia lentiscus
Cistus monspeliensis
Daphne gnidium
Phyllirea angustifolia
Thymus (vulgaris) dryest

A "feathery Genista" is seen every 800 meters.

80 kilom.

"Bunch grass" (Stipa?)
Caryis alba
Asphodelus albidus (rare)
Pistacia lentiscus
Cistus (albidus)

102 kilom.

Q. ilex
Cistus monspeliensis
5 Phlox
Thymus (vulgaris) !!

In the higher elevations (70-120 kilom.) especially at 90 kilom.)

the leaves of a "Scilla" are seen. It creeps over to the southern slope and is there common. On the same descent (and at Kil. 18, 28, 78;) I note a purple flowered Iris. The only annual seen was an *Anagallis*. The sprouts of a "*Ferula*" are common.

Tamarix dominates along all rivers. The Guadalhorce offers a *Populus* or *tweand* for the first time. *Nerium*, which is common from there on. In the deep limestone gorge it comes up hundreds of feet above the stream. The limit of *Chamaerops humilis* coincides with that of *Nerium*. The palm was not seen between Cerdeba and the Guadalhorce. Now, clear to Malaga, in hot dry waste places, is *Chamaerops*.

The Guadalhorce, leaving the Yeguas plateau, breaks through a high limestone ridge. The cliffs above Sebrantes station offer a good botanical field.

CREEKS.

DOMINANT.

Tamarix
Nerium
Deidheus tree (rare)

HILLS.

Chamaerops humilis.
Quercus ilex
"Scilla" Iris (rare)
Iris (rare)
(*Alyssum maritimum*)
"Genista"
"Feathery Genista" of the Cerdeba hills
(*Pistacia Lentiscus*)
Cistus (incanus?)
"Phlomis" *Thymus* (vulgaris)
Thymus (vulgaris)

CLIFFS

An evergreen oak shrub.
Ceratenia and *Opuntia* are abundant.
Phoenixa canariensis seen. (None as north of Guadalhorce of these three.
El Chorro station would be worthy

of an excursion.

PLANTED .

Casuarina !
Cupressus!
Eucalyptus

Abundant Water permits an intensive culture. We pass miles and miles of orange and lemon groves. Dozens of mules are loaded with the golden fruit. It is one of the most beautiful regions I have seen in Spain. Peanuts are grown. At Cartamason grapes ; but these are rare on the R.R. tracks. Olives and almonds become poorer and scarcer.

We approach the city. The river shows Tamarisk. A ditch is lined with the castor bean. The oranges disappear. They have a predilection for the deep protected mountain valleys. The mountains surrounding Malaga are covered with snow. Its cold and there is no way to get heating. It's a sleepy hollow ; but has a cachet of its own. Away from the business section, the streets are dusty, and very muddy after a rain. A slipshod administration.

On the street corners are vendors of sugar cane, at 5 cents U.S. a stalk. The boys throw pennies at the cane, if the coin sticks the cane is won ; if not the penny is forfeited. The men amuse themselves by lunging at the stalk with a huge knife. What the player splits off, belongs to him. Looks dangerous. Evidently the Malaguense loves the Navaje.

Typically African, the dark features are typically African.

I note Ch-chirimp Chimeyas in the market.

Cocos
Pritchardia filifera
Phoenix
Planted
Platanus
Platanus

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Eucalyptus
Ligustrum japonicum

A basketmaker told me that his best ware came from Belgium & Cise (France). The ware has cut off this source. Before the war the French willow cost 25¢ U.S. a kilo at Irun. Spanish Willow breaks & does not bend. Henequin costs 20¢ U.S. a kilo. Rotang (came from East Indies) 4 dollars a kilo. French dried prunes sell at 40¢ apound. An inferior quality comes from the Ebre valley.

-----MALAGA-----
END JANUARY-66----- Begin. Feb.
1917

East of the city, near Palo, I saw a few Quercus Ilex. Otherwise only Pinus pinea seen on the hills. In spots, as at the Finca Concepcion, (where it also forms the base of the dry garden) extensive plantations of this pine have been made. We see a few olive groves. A newly constructed avenue was lined with Ficus Arbutifolia Link; but in general poorly constructed - developed Platanus orientalis are the only roadside trees. Sycly are also the rare Ailanthus, Robinia, Gleditsia and Acacia. Eucalyptus is not rare. Populus albus may occur along streams. Creeks are rare. Opuntia. An Eke-like bush (in bloom) is brought as firewood.

In the flower stands I note violets, Asphodelus albus, Carnations and Narcissus.

GARDENS.

I saw hardly any deciduous trees. Conifers are rare and only Cupressus (funeris and sempervirens) seem to be doing well. In the yards species of Arancaria (excelsa!) are the most conspicuous and common plants; and we note more or less of fine Phoenix canariensis; and

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 daetylifera. The cachetis given to these gardens by the many palms. Oleander grows to immense size; but Magnolia grandiflora is rare and suffers under the heat and dryness of the region.

Casuarina
 Ceces!
 Phoenix!
 Cycas (some noble specimens)
 Dracaena
 Yucca
 Musa
 Chirimeyas
 Lemons
 Oranges
 Geranium!
 Swietenia (one)
 Ficus arbutifolia Link.
 6--- SP.
 Diospyros Kaki
 Ligustrum japonicum
 Buddleia madagascariensis Lam.
 Bougainvillea
 Heliotrope
 Roses
 Violets!

The dominant stamp on all these gardens is dryness! The paths are kept beautifully clean; and are often paved with white and black pebbles. We see no merish fountains and benches, all of white and blue tiling.

MALAGA

TO
 CONCEPCION & SAN JOSE
 Jan. 24, 1917.

Two magnificent country places
 4 kilometers from town, up the river.
 ROADSIDES.

Casuarina
 Celtis australis
 Gleditchia triacanthas!
 Eucalyptus (common)
 Alanthus glandulosus (poor)

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We meet donkeys loaded with Retama.
The two estates lie opposite each other, on the banks of a creek. Concepcion was ~~made~~ once the property of the Marquis of Casa Loring; San Jose of a rival nobleman. The neighbors vied with each other in having the finest home. Concepcion has the most beautiful garden. San Jose the most splendid house. Both have been recently sold. Concepcion to a Bilbao man for 45,000 dollars, and San Jose to French people. The latter brought 50,000 dollars: the house alone is worth the money.

Between the two places, all the water of the stream has been utilized. Concepcion has the most; and it gushes over beautiful cascades and through cement ponds.

Both houses are built on knolls on the hillside. The bottoms are filled with trees, growth. The valley proper is covered with orange and lemon groves. Camellias and Diospyros kaki are common here. Concepcion has an avenue of Phoenix a quarter of a mile long. Platanus avenues are also seen; but are as sickly as elsewhere in Malaga.

The hillsides and gullies of the se parks have been converted into wonderful garden. Not a weed to be seen in Concepcion. It is beautifully kept. All beds are covered with Mesembryanthemum and Sempervivum species; sometimes Vinca and in moist corners Violets. Cala lilies do peerly. The paths are lined with (Milla uniflora) Grah. Big patches of a red flowered Alee are a blaze of color.

We notice

Roses
Hibiscus (fine)
Geranium (in bloom)
Bougainvillia (two shades)
Heliotrope

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Bougainvillia (two shades)
Heliotrope

Digitized by Hun Institute for

Digitized by Hun Institute for

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Along the watercourses the vigorous growth of a large dissected leaved *Araucaria* (*Raphiophora*? *Neorhizophora*?) is conspicuous. Ferns are rare. The air is probably too dry for them.

The glory of Concepcion are the palms and the old *Cycas* - *Araucaria*. I only noticed *A. excelsa*; this had trunks 4 feet in diameter. At San Jose I noticed another species (perhaps *imbricaria*) fully as large.

At Concepcion palms are everywhere and in magnificent specimens.

Areca

Cocos (various!)

Chamaecrops excelsa

Livingstonia

Phoenix canariensis

- *dactylifera*

HUNDREDS

Pritchardia filifera (30 FEET*)

Sabal

Only one specimen of the Royal palm

Cuba (*Creodora*)

In front of the house is a choice collection of *Cycas*. All unprotected. The biggest I have ever seen.

Cycas cestineri

- *rebeluta*

- *sp.*

(see commercial photo)

Many *Strelitzia regina* are in flower. *Strelitzia augusta gigantea* reaches 30 feet. *Cereus* climbing the trees, reminds me of *Crizaba*. I notice a fine *Grevillea arborea* (55 feet) and a tall *Taxodium distichum*.

A conspicuous feature are the species of *Ficus*! (*elastica*) etc.) *Yucca* and *Dracaena* are abundant and vigorous. Most of the tree trunks are hidden by *Hedera*. *Laurus nobilis* and *Robinia* are suffering. *Magnolia grandiflora* miserable. one *Schinus molle*.

At San Jose a *Cedrus* and a *Taxus*, were the only plants of cooler

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regions seen; both are poor. Deciduous trees are very rare. I notice a *Swietenia* (mahogany) 2 feet in diameter and 40 feet high.

Coffee bushes are abundant in both estates. In San Jose Trees 18 feet high are covered with fruit. Bananas even are seen. Above the irrigation ditches various *Acacias* are planted (probably Australian). San Jose has an avenue of a big fruited species. Further up the dry hillsides are planted to *Pinus pinea*.

Conception is essentially a pleasure garden. It might be one of the finest botanical gardens in the world. The climate as indicated by *Ficus*, *Araucaria* and *Cocos*, is dry "Canarian"; Stamp of vegetation is evergreen.

February 13, 1917

A hailstorm! And it is cold. Watched the leading of cattle by the horns.

-----MALAGA WEST TO RIVER-----

February 3, 1917

Hedges of *Acacia Farnesiana* W. Usual garden flora with roses in bloom. *Oxalis cernua* is often (single) dominant along roadside; and a few fields are yellow with its flowers. Sandy soils, however are white with *Alyssum maritimum* L.

In these fields I collected:

Asparagus albus
Paronychia argentea Lam.
Hyssopus precumbens L.
Fumaria capreolata L.
Alyssum maritimum L. *Diploaxis catho*
Diploaxis catholica DC. (roads)
Medicago hispida Gaertn. *Erodium mala*
Erodium malacoides
Euphorbia peplus
Mercurialis
Agallia arvensis

157
Anthemis nobilis
Cynoglossum cheirifolium L;
Calendula arvensis!!
Hedyscyma polymorpha
Pteridium tangitanum (rare)
Senecio linifolius L.
 near the river bank.
Populus nigra
Tamarix
Crithmum maritimum

America has threatened to enter the war. Our consul (an englishman) says he thinks the break will come. I am debating whether to return to America or not. Went to several steamship agencies, but can cannot get any satisfaction or clear answers. To hell with them.!

-----VOYAGE MALAGA TO AMERICA-----

Left 13 February arrived in Perte Rica 1 of March.

Dawn found us at Gibraltar. Numerous ships were at anchor. Some big war vessels. A lot of little war dogs were running about, inspecting every vessel passing through the strait. Tangiers was in plain sight. Africa's limestone hills are awful bare; and show no habitations.

On the spanish shore numerous little farms are seen. The greater part of the land, however, is covered with chaparral. With brush exclusively in the gullies. The top of the Tarifa limestone ridge bears some woods, probably pines.

-----MONTPELLIER TO SPAIN -----

August 16 1920

1920

Montpellier to Spain.

From the French border to Barcelona, Vineyards and maize alternate. One patch of hazelnuts at Gerona. The hills bear either Pinus pinea or Quercus suber. Every station shows carloads of cork.

RETURN BARCELONA TO THE FRONTIER.

Sept. 13, 1920

A heavy thunderstorm last night has badly lodged the corn fields. As we shall see around Tarrega, Platanus is planted for weed, in bottoms; so here hundreds of acres bear Populus.

At first a few miles, the red sandstone (Trias?) hills are covered with Pinus (pinea). These woods however, seem artificial. I believe the vegetation is Quercus suber. Here Ulex (parviflorus) is common; and Spartium junaceum is noted. (I do not remember having seen any south of Barcelona.)

!!!!!! Throughout this trip I saw no Asphodelus !!!!!!! !!!

In the cork oak forest Pteris aquilina is abundant. The pastures are green and form a closed sod. Undergrowth abundant/

Euphorbia characias
Cistus monspeliensis
Rosmarinus officinalis

With Gerona we enter limestone. Quercus suber disappears, and Pinus halepensis is the only Conifer. However the grass sod still continues. Henceforth vineyards predominate; but north of San Miguel are great stretches of olives. (none to Barcelona) Quercus Ilex is rare. The region of Figueras means vineyards. The Pyrenees bring siliceous and the cork oak on sunny slopes we have olives, but they are rare. All is terraced, high up; for vines. The barrenness is remarkable.

Pinus pinea
Spartium
Ferula communis
Lavandula

-----BARCELONA TO VALENCIA -----
19th Aug. ; 1916

On silica we occasionally see
Pinus pinea. As far as at Arregona, grapes
are dominant. South of that Cerylus cere-
rda (tes planted 15 feet apart) Sometimes
with the hazelnuts alternating with vines
Occur. + + + + +

Then come more grapes!

-The center-

Cerylus seen at Salan and Combrils
Then miles and miles of Ceratonia siliqua
(some grapes and olives)

Pinus halepensis
Chamaecereps humilis
Quercus coccifera
Rosmarinus officinalis

Tortosa

Olives!
Rice
Quinces

SOUTH OF TORTOSA (line)
Type of Majorcan cultures.

Walnuts (fine)
Almonds
Olives + -

Then miles and miles of olives!!!!!!

We pass limestone mountains
which would be of interest to explore.
The richer plain shows.

Maize
Grapes
Walnuts
Alfalfa

Then come
Rice
Oranges
Almonds
Grapes

!!! After Bini----- A single mountain creek shows considerable Nerium Ol. Cleander. South it again disappears. The lime stone hills show pure stands of well cultivated Ceratonia. The orange trees go to the ocean side.

Before we get to the great Valencia Huerta, with its miles of oranges, and abundant apricots, we still see.

Chamaecreps humilis
Quercus coccifera
Genista scoparius

Nearer Valencia oranges disappear, and maize and alfalfa alternate. Arundo lined the ditches on the entire trip.

SALAU (Catalonia)

A center of hazel nuts.

Culture of *Corylis*.

The bush goes to within a thousand meters of the seaside. It prefers the rich irrigated bottoms; However the finest nuts are raised on the unirrigated hills of Selva. The soil is gravelly, rich in lime. The center of the market is Reus. The biggest dealer Juan Llopis, Reus. I saw thousands of sacks (110 lbs.) shipped from Tarrega. The Nuts fall to the ground. Harvest about August. Time to buy for planting in October. All must be grafted.

Root grafts 2 feet deep. New orchards use suckers, which are always abundant. The stems of the bushes are $1\frac{1}{2}$ and even 2 12 inches in diameter. In each hole four stems are planted.  give bushes like this. These clumps resemble prune trees and average 15 feet in height. They are cultivated like our orchards.



The distance between the trees

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varies between 8 & 25 feet. If pure 8 feet
The finest trees had 15 feet distance,
But I think 12 feet would be the most ad-
visable. Basking pruning. In the orchards wh
where they are planted far apart, grapes-
vines, almonds and olives are planted betw
en. On the borders they are planted 5
feet apart. Here in single stems.

Branches are often supported. Wal-
nuts rare but good. Some fine grafted Alger
obas. Near houses we see fine old Phoenix
dactylifera. reads show Platanus. At Salau.

The occasional wild patches between
the filberts offer.

Chamaereps humilis
Brachypodium ramesum Pak S.
Ulex parviflorus
Rosmarinus officinalis
Thymus vulgaris

ON BEACH. E.H.

Ammophila arenaria
Phragmites communis
Juncus
Oenothera viscosa
Euphorbia talli!

HILL (silica) of the coast.

SALAU ----- Carpet of small
of a small Plantago.

Pinus pinea (planted)
Chamaereps humilis
Brachypodium ramesum
Ulex parviflorus
Passerina hirsuta L.
Echinophora spinosa L.
Rosmarinus officinalis

~~ANCIENT DUNES~~ back from dunes-
Ancient Dunes. Further back from coast.

Pinus halepensis (Dominant)
Ammophila arenaria LK.
Brachypodium ramesum
Anthyllis vulneraria a
Cistus monspeliensis *halimifolium* Willd
Helianthemum Lavandulaefolium DC.
Bupleurum frutescens L.
Echinophora spinosa L.
Lavandula latifolia V 111.

A black and white photograph of a stone building facade. The building is constructed from large, rough-hewn stone blocks. It features several windows of varying sizes, some with simple frames and others with decorative elements. A prominent balcony with a dark, possibly wrought-iron, railing is attached to the facade. The building appears to be part of a larger complex, with a tiled roof visible at the top. The overall style is characteristic of traditional Spanish architecture.

Old City wall

Oct. 1 (Herrn at Laro

1111 *Paratrichostema*

On firmer soil here also.
Quercus illex
Andropogon hirtum L.
Cistus salvifolius

Chamaecreps humilis
Andropogon hirtus
Brachypodium ramesum
Quercus coccifera
Genista scapularis
Ulex parviflorus Peurr.
Pistacia lentiscus
Rosmarinus officinalis
Glebularia Algyptum!
Inula viscosa.

Tarrogana

Ceterach officinarum Willd.
Antirrhinum majus L.
Asperula longifolia W. & Kit.
Galium sylvestre Pol.

SAGUNTO-666

-HILL (lime)

Sept. 3, 1920

Chamaerops humilis
Asparagus acutifolius L.
horridus

Smilax aspera
Andropogon kirtum L.
Brachypodium ramosum R.&S.
Piptatherium filiforme F.B.
Scleropoa rigida Gris.
Dianthus monspessulanum L.
Silene micensis
Clematis flammula L.

Sedum amplexicaule DC.
Oenothera amplexicaule - minutissima L.
Ulex parviflorus
Ruta
Euphorbia segetalis L.
Rhamnus Alaternus L.
Rhamnus lycioides L.
Lavatera maritima Gouan
Fumana Spachii G.G.
Helianthemum pelifolium DC.
Passerina hirsuta L.
Jasione glutinosa DC.
Benwelvulus Althaceoides L.
Ajuga Iva Schreb.
Marrubium vulgare
Resmarinus officinalis
Teucrium Polium
Thymus vulgaris L.
Verbascum sinuatum L.
Achillaea ageratum L.
Atractylis humilis L.
Behniera Ritro L.

-----SAGUNTO TO SEGORBE-----

R.R. climbs up a rich gorge. Below we have oranges. Higher up corn; alfalfa, olives, and, particularly terraces with *Ceratonial*

Ulmus
Magnolia grandiflora
Robinia

The hills are bare and of a red sandstone (Triassic). *Thymus vulgaris* is the only survivor.

On limestone, I note.

Juniperus Oxycedrus
Quercus coccifera
Ulex parviflorus
Resmarinus officinalis

The crests show a few pines. The northern slopes of distant peaks also have some conifers.

Segerbe

Interesting! Beautiful location; on top of a hill. The slopes have a rich tree-growth, on account of irrigation. Walnuts 3 feet in diameter, noble specimens, but the fruit looks black. Huerta lovely. Olives! oranges, maize, alfalfa, Merus, Ulmus, Magnolia grandiflora. Visited Carlos Pau.

VALENCIA

August 21, 1920

BOTANICAL GARDEN

(If you return to these gardens, photograph them.)

The botanical is one of the richest in Europe. For beauty of arborescent specimens it is far superior to Montpellier. It is in fact the only rich botanical garden in Spain. Annuals, however, are few; and these mainly Gramineae, & Cyperaceae.

With exception of these and a few big composites, in bloom there is little to be seen outside of trees.

The grouping is artistic. A real landscape. It is a wonderful sight to see, grouped together a full sized Phoenix dactylifera, *Quercus sylvatica*, *Quercus robur*, *Yucca filifolia* and *Araucaria excelsa*. Most of the trees have the vigorous, high-stemmed type of the crowded dense forest. A habitus impressed on all the garden denizens, by the station. I suppose, however, that none of these plants find here the identical ecological conditions (and hence development) of their homes. *Quercus virginiana* & *Taxodium* were not to be recognized; although beautiful trees. The Bald Cypress is without pneumatophores and of the habitus of *Pinus pinea*.

I call attention to the want of good specimens of *Juglans*. This is perhaps

accidental as *Carya olivaeformis* is one of the most beautiful specimens in the gardens. As in Madrid the Moorish system of irrigation, by stone channels and dirt ditches does not allow a variation of moisture. All the plants receive the same amount. The dense shade of these noble trees, makes the growth of sun-loving plants impossible.

Although there are big lath houses and even glass winter houses, for abundant potted plants, there is nothing of interest. In dry neglected corners *Pinus halepensis* grows vigorously: a plant we find throughout the district, in the gardens and on the dry limestone hills, with the olive and *Ceratania*. In the botanical garden, we note fine fine *Platanus orientalis*? the common street tree.

Although in the parks of Valencia, *Ficus* species are wanting well represented, they are wanting here.

Here a deep rich soil and a generous supply of muddy water, creates an entirely artificial edaphic station. It is the equivalent of the ancient gallery fringes and bottoms of Valencia. As said it is a most interesting, rich, curious and beautiful mingling of palms and deciduous trees; with a sprinkling of conifers. The latter are rare. One or two *Pinus pyrenaica* and several *Pinus canariensis*; are well developed; and of course *Pinus pinea* is in its glory. Otherwise *Cupressus* seems to be the only one "at home".

MAGNIFICENT SPECIMENS

66666-----666666666

Cupressus terulea (Himalaya) 2 feet.
 6- *thurifera* (Mexico) 2 1/2 feet
 Height 50 feet

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Cupressus pendula (Japan)
 - glauca (India)
 - sempervirens
 6 Benthami (Mexico)

-----GOOD SIZED TREES -----

Araucaria excelsa (Norfolk Island)
 6--(3 feet in diameter)
 Cephalotaxus drupacea
 Cryptomeria japonica
 Pedocarpus latifolius (Japan)

In the gardens of the city we find many other Araucarias (Cunninghami, Bidwellii, braziliensis) planted extensively; but they are not so vigorous as elsewhere in Europe.

In the Botanical Garden, some of the trees are so large that they surprise the botanist. Of these wonders I cite.

Callitris quadrivalvis
 Casuarina glauca
 Yucca filifera (7 feet in diameter)
 - dracenis (W. Indies)
 - aloifolia
 Cordyline indivisa (N. Zealand) 35 feet
 Carya olivacea (N. America)
 Cheisya speciosa (Brazil) 5 feet diam

The dominant type of the vegetation; that is the vegetation of this artificial station of a grouping represented by the following noble specimens.

Quercus castanifolia (Caucasus)
 - polymerpha (Mexico)
 - rebur
 - virginiana
 Carpinus Betulus (2 feet diameter
 50 feet high)
 Celtis occidentalis
 Liriodendron tulipifera

- Liquidambar styraciflua
- Cerculia (Stereulia?) trichosipena (Australia)
- Gleditchia triancanthes
- robusta
- Sephera japemica
- Tilia grandiflora
- tomentosa
- Diospyres calycina
- Lotus
- Pubescens
- virginiana

To the above lists of finest specimens, we may add a few Eucalyptus (E. cernuta) and a Ginkgo biloba, finer than at Montpellier.

However this does not exhaust the list of magnificent trees. Only the giants are named above.

- Noble specimens are seen of
- Pedocarpus latifolius (India)
- E pulus acnilifera (India)

-Fraxinus-

- Pterocarya fraxinifolia (Orient)
- Fagus sylvatica
- Ulmus parviflorus
- Zelkewia crenata
- Maelura auranteaca
- Apellonias canariensis
- Cereis siliquastrum
- Erathrina Crysta gallii (Brasi)
- Sapium sebiferum (trebiferum 1 (tropical Asia)
- Acer oblongum (Himalaya)
- obtusatum
- rubrum
- Lagunaria paterrenii (Norfolk Island)
- Stereulia acrifolia
- platanifolia
- Fraxinus pallida

Last but not least, we consider the most striking of the garden. The palms! They are not numerous; but remarkable

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by their strange habitus amongst the broad leaved trees.

Fine specimens are;

!! *Chamaecyparis humilis* (25 feet in height)
Cycas revoluta (10 feet)
Livingstonia sinensis
Phoenix dactylifera
- *reclinata*
Pritchardia filifera
Sabal Blackbourianum
Trachycarpus excelsa

In *Valechia* *Phoenix dactylifera* is planted everywhere; whereas *Phoenix canariensis* is rarely seen.

If all the preceding plants are noteworthy by their size and beauty, (so that, of some one can speak a veritable vocation), there remains a large number of trees that are evidently suffering?

Cedrus deodora

Quercus Ilex

- *suber*

Grevillea robusta

Schinus molle

Aesculus Hippocastanum

Catalpa

In the gardens of the city are abundant:

Bougainvillea

Plumbago campestris

Tecoma

I visited the immense rice fields of the Albufera. Small patches are also seen around the villages. These were badly lodged; by a heavy thunderstorm last night. A patch of *Alcornoques* (*Cyperus*) attracts attention. Otherwise, the dominant crops through the Huerta, are maize and alfalfa. Onions now form the bulk of the exports. Stacks of them are seen piled up in the fields; covered with rush roofs. Then we see beans, peanuts, beets, *Faba vulgaris*, *Cicer Arietinum*, potatoes and a few vegetables. Waste patches are probably wheat fields and are now harvested.

Apricots are abundant. Oranges rare about town. All ditched are lined with Arundo. Dryer foothills show vines, olives and Ceratonia. Burn roads. Yesterday dust; today mud.

Visited the cave dwelling s of Binimant today. Interesting. \$1

The "Grau" is a dirty hole. The bathing beach is muddy.!

TILE MANUFACTURERS

6666----- VALENCIA SPAIN. -----

The most modern is perhaps
"Valencia Industrial S.A."
3 Alfredo Calderon

They had a beautiful tile picture of a city patio for 250 pesetas. Their other tiles 15 x 15 cent. average 2.15 pesetas apiece. The factory makes the tiles after your own designs. Ask for colored catalogue, if necessary.

However I think it would be best to get everything from.

José Pres-"La Cerame"

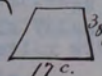
6
Camino de Burga
Burjaset,
Valencia, Spain

He has an enormous lot of old (childish!) valencian tiles; which he would copy for you.

Thus ancient style blue 20 x 20 Cen will cost 1.50 a piece.

His speciality is roofing tiles.

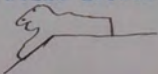
DEEP BLUE \$11
WHITE
GREEN



COST 2.50
pesetas
each.

Another style with a copper sheen is more expensive. These are used mainly for ridge rolls. Big ridge rolls are worth 6 pesetas each.

Big dragencorners
(copper sheen) 30 pesetas.



-----Valencia --- Jativa -----

RICE!!!!

(Badly lodged by the stern) The coast is lined with ricefields clear to Gandia Garbanzos , maize. Hills mainly devoted to Ceratonia, olives rarer. As we approach the mountains, the irrigated valley for miles; show fine orange groves. At A Alvira the Jucar river offers bounteous water. Oranges are dominant; rice abundant. Carcagente:

Oranges!

Pomegranates!

New , on the hills an isolated Quercus Ilex or Pinus halepensis. The limestone mountains show a few pines.

Jativa is picturesque. Rice terraces olives, oranges, apples, Musa, Hibiscus, Phoenix dactylifera.

-----JATIVA TO ALCOCY-----

Hills Pinus halepensis. Plateau extremely barren. For miles the vineyards were destroyed by Phylloxera; but are now picking up. Noticed a few walnuts, Merus, olives, almonds; potatoes, maize. Even here a along watercourses , we see rice patches.

Relicts of the past vegetation are rare

Chamaecreps humilis

Pinus halepensis

Quercus Ilex

The summit (with the Sierra de Mariela to the west) is bare limestone. Only a few Pinus halepensis and a patch of fine Quercus Ilex.

-----ALCOY-----

Situation is of rare beauty!!

The city is surrounded by terraced olive groves. Whilst (under irrigation)

the gulches show the usual maize and alfalfa patches. *Opuntia* abundant.
An immense spring furnishes the power for many woolen mills.

The stamp of the region is that of dryness and barrenness. A desert type.

The mountain roads are lined with *Ailanthus glandulosa* (good)

In the park.

- Abies*
- Cedrus*
- Cupressus* POOR
- Pinus*
- Tilia*
- Magnolia grandiflora* (a wreck)

- Phoenix canariensis*
- Casuarina*
- Pinus halepensis*
- Juniperus* (*Oxycedrus*)
- Buxus balearica*
- Platanus*

ALCOVE TO GANDIA-----

August 30, 1920

The ridges are limestone. The intervening spaces are filled with late tertiary gravels. All bear the stamp of the desert. They are terraced and planted to olives and grapes. *Ailanthus* grows subspicuously. Irrigation brings maize, alfalfa, apricots, figs, apples, almonds and fine walnuts.

Throughout this region, the olive is dominant. *Algeria* practically wanting until we near the coast

Creeks show *Nerium Oleander*.

Of the native flora I note.

Chamaecreps humilis (reeds)

Brachypodium ramosum

Pinus halepensis

Quercus ilex (rare)

- *coccifera*

Pistacia lentiscus

Ulex parviflorus

Anthyllis cystoides
Benjeana hirsuta

Genista scorpiurus

-----Villalonga!!!!!!-----

To the south an elevated saw toothed limestone ridge. Pines on the crest! An ideal field for research.

Then as the valley opens, out onto the coastal plain, miles of orange groves. The hills still with olives. At the stations Esparto is being unloaded. *Eucalyptus globulus* is miserable.

Gandia -- Carcagente

For miles the train follows the coastal plain; with its ricefields, some low on groves, walnuts, figs and almonds.

A few pines were seen on the beach. To the west the dry limestone ridges show an occasional *Pinus halepensis*.

With Jeresa, we enter a tributary valley. *Ceratenia* now appears. Bottoms, Cran ges, some Musa.

Sinat de Valdina, a valley that reminds me of Sella; with its orange groves. The bare hills however, show *Ceratenia*.

We cross the divide into the valley of the Jucar. Picturesque hills with dense woods of *Pinus halepensis*; *Chamaecyparis* as undergrowth and *Ceratenia* where cleared.

Brachypodium ramesum

Quercus coccifera

Clematis

Genista scorpiurus

Daphne gnidium

Perula

I notice that in this region the base of the orange trees are laid bare, and often surrounded by a dike, to keep the trunk away from the water.

VALENCIA - UTIEL

August 31, 1920

Peethills dominant dominant Alge-
reba; many olives (planted in mound s
also some grapes.

Goats have cleaned out the native
vegetation. It is now rare. Greeks show Meri
um Oleander.

Brachypodium (ramesum)

Pinus halepensis

Quercus ilex

Genista scorpius

Ulex parviflora

Pistacia Lentiscus

Lavaandula

Resmarinus officinalis

"*Micromeria*" (*Thymus Mastichiana?*)

Atractylis humilis L.

The bleak plateau offers a few
patches of fine *Quercus ilex* (at Rebellas)

Ulex parviflorus is dominant.

Brachypodium - ramesum

Quercus coccifera!!

(*Anthyllis cytoides*?)

Bupleurum junceum

Thymus vulgaris

Atractylis humilis L.

On the heights *Juniperus Oxyced*
rus and *Resmarinus*.! The plateau has wate
r available, and hence alfalfa, a maize,
apples, wheat and fine walnut trees.

-----VALENCIA - CEQUENA-----

Miles of grapes! Cult.

Robinia

Almonds

Pinus pinca

I notice that in this region
the base of the orange trees are laid
down, and often surrounded by a disk of
water. Keep the trunk away from the water.

Parte Ceely

PORTO COELI

Sept; 1 1920

We leave the R.R. at Betera and travel in a cart to the pineclad hills. The rock is limestone. We pass vineyard and Ceratonia.

In waste places /

- Chamaerops humilis
- Brachypodium mucronatum Wk.
- Juniperus Oxycedrus
- Quercus coccifera!
- Quercus Ilex (rare)
- (Passerina hirsuta)
- Phyllyrea angustifolia

As we reach the limestone hills we enter an extensive forest of Pinus halepensis, with.

- Chamaerops humilis
- Brachypodium ramosum Wk.
- Stipa tenacissima
- Juniperus Oxycedrus
- Quercus coccifera
- Anthyllis cytiseoides
- Benjamina hirsuta Rehb.
- Ulex parviflorus Ten. (common higher up)

- Pistacia Lentiscus
- Rhamnus lycioides
- Fumana Spachii

Now the immense mass of the old monastery of Porto Ceeli looms in sight; with its big stone bridge. It is one of the most beautiful places to live I have seen in Spain. Its climate is ideal. These old monks always picked out the best places. The hills are all clad with forests of Pinus halepensis. Rich slopes have been cleared and mainly planted to Ceratonia. The finest Algarobes that I have ever seen. Olives are fewer.

Above the convent on Triassic sandstone I note /

DITCH lined with
Nerium oleander
Myrtus communis
Isula viscosa
 FOREST OF PINUS HALEPENSIS
 DOMINANT.

Ulex parviflorus Pour.

Abundant

Quercus coccifer

Viburnum Tinus

More or less:

Juniperus Oxycedrus

Andropogon hirtum L.

Brachypedium mucronatum

Chamaecropha humilis

Asparagus acutifolius

herridus

Smilax aspera

Quercus ilex

Gayris alba

Clematis Flammula

Rhamnus lycioides L.

Cistus monspeliensis

salvifolius

Fumana Spachii

Eupherbia segetalis L.

Myrtus communis

Erica multiflora

Resmarinus (very rare)

Atractylis humilis

As we go up this beautiful valley we see one or two lovely summer homes hidden in the woods. Here a limestone belt appears, and I collect

Brachypedium mucronatum (covers the ground)

Myrtus communis (moist)

Hedera Helix (moist)

Helichrysum stoechas

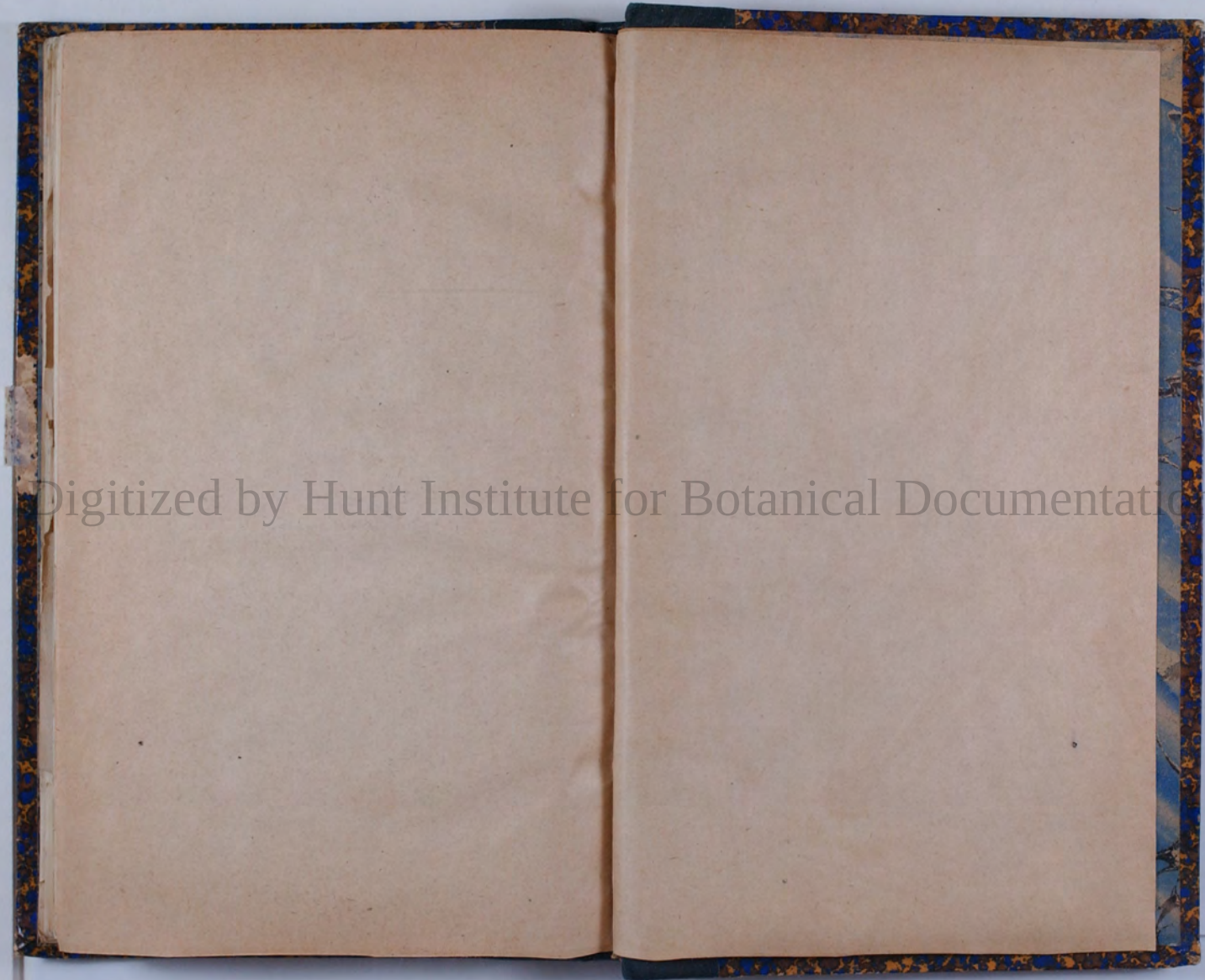
Aglydaris panacifolia Lange

Phyllirea angustifolia

Nerium Oleander (moist)

Resmarinus officinalis

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