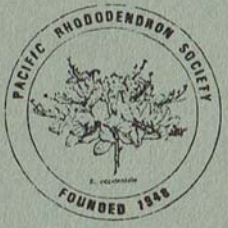
Vol. III., No. IV., 1928.

# The Rhododendron Society Notes.

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THE PACIFIC RHODODENDRON SOCIETY

# Acknowledgements

## TO THIS ONLINE EDITION

The three volumes of *Rhododendron Society Notes* issued between 1917 and 1931 in fifteen parts could not have been published online without the generosity of others.

The Rhododendron, Camellia & Magnolia Group extend their thanks to the descendants of the contributing authors, and others who are now responsible for the copyright, for permitting those words to be reproduced in this format.

In particular, we are indebted to Fred Whitney, the last remaining officer of the Pacific Rhododendron Society which produced and published the facsimile edition in 1976, who has so graciously allowed it to be scanned to create the current version.



RHODODENDRON, CAMELLIA
& MAGNOLIA GROUP

A ROYAL HORTICULTURAL SOCIETY GROUP

2017


# THE PACIFIC RHODODENDRON SOCIETY

*"Dedicated to the Hobbiest and Home Gardeners"*

## Foreword

The Pacific Rhododendron Society has reprinted the Rhododendron Notes in an effort to further the knowledge of the Genus Rhododendron by those enthusiasts with an avid interest in the history, exploration and biographical sketches contained herein.

The Rhododendron Notes are offered to the end that the reader may more easily understand the progress encouraged by those who contributed the wealth of information contained in these volumes, thereby making clear our understanding of the Genus Rhododendron today.

The Society wishes to gratefully acknowledge the efforts on our behalf by the following persons and organizations: Dr. R. Shaw, Curator and M.V. Mathew, Librarian of the Royal Botanic Garden Edinburgh, Scotland, for providing the missing numbers; Lord Aberconway and John Cowell, Secretary of the Royal Horticultural Society, for certain photocopies and other considerations, Sir Giles Loder and Sir Edmund de Rothchild for their esteemed counsel, and to Thomas V. Donnelly our printer.

Our greatest appreciation to Dan E. Mayers of Lorien, Wadhurst, England for providing the originals and the inspiration. Without his assistance this project would never have become a reality.

**The Pacific Rhododendron Society**
**1976**


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# NOTES

CONTRIBUTED BY

MEMBERS OF THE SOCIETY

FOR THE YEAR

1928

All communications regarding the publications of the Rhododendron Society should be made to Charles Eley, Esq., East Bergholt, Suffolk.

Vol. III., No. IV., 1928.

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MEMBERS' NOTES FOR THE YEAR 1928.

## INDEX TO VOL III., PART IV.

## LIST OF RHODODENDRON SPECIES

The Rhododendrons other than New Guinea and Malayan may be divided into the following series :—

No. 1. Albiflorum.
2. Anthopogon.
3. Arboreum (with subseries Arboreum and Argyrophyllum).
4. Auriculatum.
5. Azalea (with subseries Canadense, Luteum, Nipponicum, Obtusum, Schlippenbachii, and Tashiroi).
6. Barbatum (with subseries Barbatum, Crinigerum, Glischrum, and Maculiferum).
7. Boothii.
8. Camelliaeflorum
9. Campanulatum.
10. Campylogynum.
11. Camtschaticum.
12. Carolinianum.
13. Cephalanthum.
14. Cinnabarinum.
15. Dauricum.
16. Edgeworthii.
17. Falconeri.
18. Ferrugineum.
19. Fortunei (with subseries Calophytum, Davidii, Fortunei, Griffithianum, Orbiculare, and Oreodoxa).
20. Fulvum.
21. Glaucum.
22. Grande.
23. Heliolepis.
24. Irroratum (with subseries Irroratum and Parishii).
25. Lacteum.
26. Lapponicum.
27. Lepidotum.
28. Maddenii (with subseries Ciliicalyx, Maddenii, and Megacalyx).
29. Micranthum.
30. Moupinense.
31. Neriiflorum (with subseries Forrestii, Haematodes, Neriiflorum, and Sanguineum).
32. Ovatum.
33. Ponticum (with subseries Caucasicum and Ponticum).
34. Saluenense.
35. Scabrifolium.
36. Semibarbatum.
37. Stamineum.
38. Taliense (with subseries Adenogynum, Roxieanum, Taliense, and Wasonii).
39. Thomsonii (with subseries Campylocarpum, Martinianum, Selense, Souliei, and Thomsonii).
40. Trichocladum.
41. Triflorum (with subseries Augustinii, Hanceanum, Oreotrephes, Polylepis, Triflorum, and Yunnanense).
42. Vaccinioides.
43. Virgatum.

### No. 1. Albiflorum Series

albiflorum, *Hook.*

### No. 2. Anthopogon Series

anthopogon, *D. Don.*
Collettianum, *Aitch. et Hemsl.*
haemonium, *Balf. f. et Cooper.*
hypenanthum, *Balf. f.*
rufescens, *Franch.*
tsarongense, *Balf. f. et Forrest.*

### No. 3. Arboreum Series

*Subseries Arboreum*

arboreum, *Smith.*
Sub-species :
Campbelliae, *Hook. f.*
cinnamomeum, *Wall.*
Kingianum, *Watt.*
nilagiricum, *Zenker.*
Windsori, *Nutt.*
zeylanicum, *Hort. ex Loud.*
Delavayi, *Franch.*
niveum, *Hook. f.*
peramoenum, *Balf. f. et Forrest.*

*Subseries Argyrophyllum.*

argyrophyllum, *Franch.*
Coryanum, *Tagg et Forrest.*
denudatum, *Levl.*
farinosum, *Levl.*
floribundum, *Franch.*
fokienense, *Franch.*
formosanum, *Hemsley.*
Hunnewellianum, *Rehder et Wilson.*
hypoglaucum, *Hemsley.*
insigne, *Hemsl. et Wils.*
longipes, *Rehder et Wilson.*
Ririei, *Hemsl. et Wils.*
Rockii, *Wilson.*
simiarum, *Hance.*
Thayerianum, *Rehder et Wilson.*

### No. 4. Auriculatum Series

auriculatum, *Hemsley.*
Griersonianum, *Balf. f. et Forrest.*

### No. 5. Azalea Series

*Subseries Canadense*

Albrechtii, *Maxim.*
canadense, *Torrey.*
pentaphyllum, *Maxim.*
Vaseyi, *Gray.*

*Subseries Luteum*

alabamense, *Rehder.*
arborescens, *Torrey.*
atlanticum, *Rehder.*
austrinum, *Rehder.*
calendulaceum, *Torrey.*
canescens, *Sweet.*
japonicum, *Suringar.*
luteum, *Sweet.*
molle, *G. Don.*
nudiflorum, *Torrey.*
oblongifolium, *Millais.*
occidentale, *Gray.*
prunifolium, *Millais.*
roseum, *Rehder.*
serrulatum, *Millais.*
speciosum, *Sweet.*
viscosum, *Torrey.*

*Subseries Nipponicum*

nipponicum, *Matsumura.*

*Subseries Obtusum*

annamense, *Rehder.*
atrovirens, *Franch.*
boninense, *Nakai.*
breviperulatum, *Hayata.*
hainanense, *Merrill.*
indicum, *Sweet.*
Kanehirai, *Wilson.*
lasiostylum, *Hayata.*
linearifolium, *Sieb. et Zucc.*
longiperulatum, *Hayata.*
Mariae, *Hance.*
microphytum, *Franch.*
mucronatum, *G. Don* (ledifolium, *G. Don*).
Nakaharai, *Hayata.*
obtusum, *Planchon.*
Oldhamii, *Maxim.*

pulchrum, *Sweet.*
rivulare, *Hand.-Mazz.*
rubropilosum, *Hayata.*
rufohirtum, *Hand.-Mazz.*
Sasakii, *Wilson.*
scabrum, *G. Don.*
Seniavinii, *Maxim.*
serpyllifolium, *Miquel.*
Simsii, *Planchon.*
subsessile, *Rendle.*
tosaense, *Makino.*
Tschonoskii, *Maxim.*
yedoense, *Maxim.*

*Subseries Schlippenbachii*

Farrerae, *Tate.*
Mariesii, *Hemsley et Wilson.*
quinquefolium, *Bisset et Moore.*
reticulatum, *D. Don.* (apud *G. Don*).
Schlippenbachii, *Maxim.*
Weyrichii, *Maxim.*

*Subseries Tashiroi*

Tashiroi, *Maxim.*

### No. 6. Barbatum Series

*Subseries Barbatum*

argipeplum, *Balf. f. et Cooper.*
barbatum, *Wall.*
imberbe, *Hutch.*
Smithii, *Nutt.*

*Subseries Crinigerum*

Bainbridgeanum, *Tagg et Forrest.*
crinigerum, *Franch.*

*Subseries Glischrum*

diphrocalyx, *Balf. f.*
glischroides, *Tagg et Forrest.*
glischrum, *Balf. f. et W. W. Sm.*
habrotrichum, *Balf. f. et W. W. Sm.*
hirtipes, *Tagg.*
rude, *Tagg et Forrest.*
spilotum, *Balf. f. et Farrer.*
vesiculiferum, *Tagg.*

*Subseries Maculiferum*

anwheiense, *Wilson.*
longesquamatum, *Schneider.*
maculiferum, *Franch.*
monosematum, *Hutch.*
Morii, *Hayata.*
nankotaisanense, *Hayata.*
pachytrichum, *Franch.*
pseudochrysanthum, *Hayata.*
strigillosum, *Franch.*

### No. 7. Boothii Series

aureum, *Franch.*
Boothii, *Nutt.*
cerinum, *Balf. f. et Forrest.*
chrysolepis, *Hutch. et Ward.*
commodum, *Balf. f. et Forrest.*
deleiense, *Hutch. et Ward.*
leucaspis, *Tagg.*
megeratum, *Balf. f. et Forrest.*
mishmiense, *Hutch. et Ward.*
monanthum, *Balf. f. et W. W. Sm.*
sulfureum, *Franch.*
tephropeplum, *Balf. f. et Farrer.*
theiochroum, *Balf. f. et W. W. Sm.*

### No. 8. Camelliaeflorum Series

camelliaeflorum, *Hook. f.*
lucidum, *Nutt.*

### No. 9. Campanulatum Series

aeruginosum, *Hook. f.*
campanulatum, *D. Don.*
fulgens, *Hook. f.*
lanatum, *Hook. f.*
Wallichii, *Hook. f.*

### No. 10. Campylogynum Series

campylogynum, *Franch.*
charopoeum, *Balf. f. et Farrer.*
cremastum, *Balf. f. et Forrest.*
myrtilloides, *Balf. f. et Ward.*

### No. 11. Camtschaticum Series

camtschaticum, *Pallas.*
glandulosum, *Standley.*
Redowskianum, *Maxim.*

### No. 12. Carolinianum Series

carolinianum, *Rehder.*
Chapmanii, *Gray.*
minus, *Michaux* (punctatum, *Andrews*).

### No. 13. Cephalanthum Series

acraium, *Balf. f. et W. W. Sm.*
Adamsii, *Rehder.*
anthopogonoides, *Maxim.*
cephalanthoides, *Balf. f. et W. W. Sm.*
cephalanthum, *Franch.*
chamaetortum, *Balf. f. et Ward.*
clivicola, *Balf. f. et W. W. Sm.*
crebreflorum, *Hutch. et Ward.*
cremnophilum, *Balf. f. et W. W. Sm.*
daphniflorum, *Diels.*
gymnomiscum, *Balf. f. et Ward.*
ledoides, *Balf. f. et W. W. Sm.*
lepidanthum, *Balf. f. et W. W. Smith.*
nmaiense, *Balf. f. et Ward.*
platyphyllum, *Balf. f. et W. W. Sm.*
praeclarum, *Balf. f. et Farrer.*
primulaeflorum, *Bur. et Franch.*
radinum, *Balf. f. et W. W. Sm.*
Sargentianum, *Rehder et Wilson.*
sphaeranthum, *Balf. f. et W. W. Sm.*
trichostomum, *Franch.*

### No. 14. Cinnabarinum Series

cinnabarinum, *Hook. f.*
Keysii, *Nutt.*

### No. 15. Dauricum Series

dauricum, *Linn.*
mucronulatum, *Turcz.*

### No. 16. Edgeworthii Series

bullatum, *Franch.*
Edgeworthii, *Hook. f.*
pendulum, *Hook. f.*
sciaphilum, *Balf. f. et Ward.*
seinghkuense, *Ward.*

### No. 17. Falconeri Series

arizelum, *Balf. f. et Forrest.*
basilicum, *Balf. f. et W. W. Sm.*
coriaceum, *Franch.*
decipiens, *Lacaita.*
eximium, *Nutt.*
Falconeri, *Hook. f.*
fictolacteum, *Balf. f.*
galactinum, *Balf. f.*
Hodgsonii, *Hook. f.*
lanigerum, *Tagg.*
preptum, *Balf. f. et Forrest.*
rex, *Levl.*
sino-Falconeri, *Balf. f.*

### No. 18. Ferrugineum Series

ferrugineum, *Linn.*
hirsutum, *Linn.*
Kotschyi, *Simon.*

### No. 19. Fortunei Series

*Subseries Calophytum*

calophytum, *Franch.*
Openshawianum, *Rehder et Wilson.*

*Subseries Davidii*

Davidii, *Franch.*
planetum, *Balf. f.*
praevernum, *Hutch.*
sutchuenense, *Franch.*

*Subseries Fortunei*

decorum, *Franch.*
diaprepes, *Balf. f. et W. W. Sm.*
discolor, *Franch.*
Fortunei, *Lindl.*
glanduliferum, *Franch.*
Hemsleyanum, *Wilson.*
Houlstonii, *Hemsley et Wilson.*
serotinum, *Hutch.*
vernicosum, *Franch.*
geographical forms of vernicosum:
araliaeforme, *Balf. f. et Forrest.*
euanthum, *Balf. f. et W. W. Sm.*
rhantum, *Balf. f. et W. W. Sm.*
Sheltonae, *Hemsley et Wilson.*

*Subseries Griffithianum*

Griffithianum, *Wight.*

*Subseries Orbiculare*

orbiculare, *Decaisne.*

*Subseries Oreodoxa*

erubescens, *Hutch.*
Fargesii, *Franch.*
oreodoxa, *Franch.*
  geographical forms of oreodoxa :
    haematocheilum, *Craib.*
    Limprichtii, *Diels.*
    Reginaldii, *Balf. f.*
praeteritum, *Hutch.*

### No. 20. Fulvum Series

dendritrichum, *Balf. f. et Forrest.*
fulvoides, *Balf. f. et Forrest.*
fulvum, *Balf. f. et W. W. Sm.*
niphargum, *Balf. f. et Ward.*
uvarifolium, *Diels.*

### No. 21. Glaucum Series

brachyanthum, *Franch.*
charitopes, *Balf. f. et Farrer.*
charitostreptum, *Balf. f. et Ward.*
Genestierianum, *Forrest.*
glaucum, *Hook. f.*
hypolepidotum, *Balf. f. et W. W. Sm.*
pruniflorum, *Hutch. et Ward.*
shweliense, *Balf. f. et Forrest.*
tsangpoense, *Hutch. et Ward.*

### No. 22. Grande Series

coryphaeum, *Balf. f. et Forrest* (semnum, *Balf. f. et Forrest*).
giganteum, *Forrest.*
grande, *Wight* (argenteum, *Hook. f.*).
Macabeanum, *Watt.*
peregrinum, *Tagg.*
praestans, *Balf. f. et W. W. Sm.*
protistum, *Balf. f. et Forrest.*
semnoides, *Tagg et Forrest.*
sidereum, *Balf. f.*
sinogrande, *Balf. f. et W. W. Sm.*
Watsonii, *Hemsley et Wilson.*

### No. 23. Heliolepis Series

brevistylum, *Franch.*
desquamatum, *Balf. f. et Forrest.*
fumidum, *Balf. f. et W. W. Sm.*
heliolepis, *Franch.*
invictum, *Balf. f. et Farrer.*
Leclerei, *Levl.*
oporinum, *Balf. f. et Ward.*
pholidotum, *Balf. f. et W. W. Sm.*
rubiginosum, *Franch.*

### No. 24. Irroratum Series

*Subseries Irroratum*

agastum, *Balf. f. et W. W. Sm.*
Annae, *Franch.*
anthosphaerum, *Diels.*
  Sub-species :
    hylothreptum, *Balf. f. et W. W. Sm.*
araiophyllum, *Balf. f. et W. W. Sm.*
cerochitum, *Balf. f. et Forrest.*
dimitrum, *Balf. f. et Forrest.*
epapillatum, *Balf. f. et Cooper.*
eritimum, *Balf. f. et W. W. Sm.*
  Sub-species :
    chawchiense, *Balf. f. et Farrer.*
    gymnogynum, *Balf. f. et Forrest.*
    heptamerum, *Balf. f.*
    persicinum, *Hand.-Mazz.*
Hardingii, *Forrest.*
irroratum, *Franch.*
Kendrickii, *Nutt.*
laxiflorum, *Balf. f. et Forrest.*
leptopeplum, *Balf. f. et Forrest.*
lukiangense, *Franch.*
  Sub-species :
    admirabile, *Balf. f. et Forrest.*
    adroserum, *Balf. f. et Forrest.*
    ceraceum, *Balf. f. et W. W. Sm.*
    gymnanthum, *Diels.*

mengtszense, *Balf. f. et W. W. Sm.*
ningyuenense, *Hand.-Mazz.*
ombrochares, *Balf. f. et Ward.*
papillatum, *Balf. f. et Cooper.*
pennivenium, *Balf. f. et Forrest.*
pogonostylum, *Balf. f. et W. W. Sm.*
Shepherdii, *Nutt.*
spanotrichum, *Balf. f. et W. W. Sm.*
tanastylum, *Balf. f. et Ward.*

*Subseries Parishii*

agapetum, *Balf. f. et Ward.*
Elliottii, *Watt.*
eriogynum, *Balf. f. et W. W. Sm.*
facetum, *Balf. f. et Ward.*
Kyawi, *Lace et W. W. Sm.*
Parishii, *C. B. Clarke.*
schistocalyx, *Balf. f. et Forrest.*

### No. 25. Lacteum Series

aberrans, *Tagg et Forrest.*
aiolopeplum, *Balf. f. et Forrest.*
Beesianum, *Diels.*
colletum, *Balf. f. et Forrest.*
dictyotum, *Balf. f.*
dryophyllum, *Balf. f. et Forrest.*
dumosulum, *Balf. f. et Forrest.*
emaculatum, *Balf. f. et Forrest.*
lacteum, *Franch.*
levistratum, *Balf. f. et Forrest.*
nakotiltum, *Balf. f. et Forrest.*
sigillatum, *Balf. f. et Forrest.*
Traillianum, *Forrest et W. W. Sm.*
Wightii, *Hook. f.*

### No. 26. Lapponicum Series

achroanthum, *Balf. f. et W. W. Sm.*
alpicola, *Rehder et Wilson.*
blepharocalyx, *Franch.*
cantabile, *Balf. f.*
capitatum, *Maxim.*
chamaezelum, *Balf. f. et Forrest.*
chryseum, *Balf. f. et Ward.*
complexum, *Balf. f. et W. W. Sm.*
cuneatum, *W. W. Sm.*
dasypetalum, *Balf. f. et Forrest.*
diacritum, *Balf. f. et W. W. Sm.*
drumonium, *Balf. f. et Ward.*
Edgarianum, *Rehder et Wilson.*
fastigiatum, *Franch.*
flavidum, *Franch.*
hippophaeoides, *Balf. f. et W. W. Sm.*
idoneum, *Balf. f. et W. W. Sm.*
impeditum, *Balf. f. et W. W. Sm.*
intricatum, *Franch.*
lapponicum, *Wahlenberg.*
litangense *Balf. f.*
lysolepis, *Hutch.*
muliense, *Balf. f. et Forrest.*
nigropunctatum, *Bur. et Franch.*
nitidulum, *Rehder et Wilson.*
nivale, *Hook. f.*
orthocladum, *Balf. f. et Forrest.*
paludosum, *Hutch. et Ward.*
parvifolium, *Adams.*
polifolium, *Franch.*
polycladum, *Franch.*
ramosissimum, *Franch.*
ravum, *Balf. f. et W. W. Sm.*
rupicola, *W. W. Sm.*
russatum, *Balf. f. et Forrest.*
scintillans, *Balf. f. et W. W. Sm.*
setosum, *D. Don.*
stictophyllum, *Balf. f.*
tapetiforme, *Balf. f. et Ward.*
telmateium, *Balf. f. et W. W. Sm.*
thymifolium, *Maxim.*
verruculosum, *Rehder et Wilson.*
violaceum, *Rehder et Wilson.*
Websterianum, *Rehder et Wilson.*
yungningense *Balf. f.*

### No. 27. Lepidotum Series

Baileyi, *Balf. f.*
elaeagnoides, *Hook. f.*
imperator, *Hutch. et Ward.*
lepidotum, *Wall.*
obovatum, *Hook. f.*
patulum, *Hutch. et Ward.*
pumilum, *Hook. f.*
thyodocum, *Balf. f. et Cooper.*
uniflorum, *Hutch. et Ward.*

### No. 28. Maddenii Series

*Subseries Ciliicalyx*

burmanicum, *Hutch.*
carneum, *Hutch.*
ciliatum, *Hook. f.*
ciliicalyx, *Franch.*
ciliipes, *Hutch.*
Cubittii, *Hutch.*
Cuffeanum, *Craib.*
dendricola, *Hutch.*
formosum, *Wall.*
inaequale, *Hutch.*
iteophyllum, *Hutch.*
Johnstoneanum, *Watt.*
lasiopodum, *Hutch.*
Ludwigianum, *Hosseus.*
Lyi, *Levl.*
missionarium, *Levl.*
notatum, *Hutch.*
pachypodum, *Balf. f. et W. W. Sm.*
pilicalyx, *Hutch.*
pseudociliicalyx, *Hutch.*
roseatum, *Hutch.*
rufosquamosum, *Hutch.*
scopulorum, *Hutch.*
Scottianum, *Hutch.*
Smilesii, *Hutch.*
supranubium, *Hutch.*
Surasianum, *Balf. f. et Craib.*
taronense, *Hutch.*
Valentinianum, *Forrest.*
Veitchianum, *Hook. f.*

*Subseries Maddenii*

brachysiphon, *Balf. f.*
calophyllum, *Nutt.*
crassum, *Franch.*
excellens, *Hemsley et Wilson.*
Maddenii, *Hook. f.*
manipurense, *Balf. f. et Watt.*
odoriferum, *Hutch.*
polyandrum, *Hutch.*

*Subseries Megacalyx*

Dalhousiae, *Hook. f.*
liliiflorum, *Levl.*
Lindleyi, *Moore.*
megacalyx, *Balf. f. et Ward.*
Nuttallii, *Booth.*
rhabdotum, *Balf. f. et Cooper.*
sinonuttallii, *Balf. f. et Forrest.*
Taggianum, *Hutch.*

### No. 29. Micranthum Series

micranthum, *Turcz.*

### No. 30. Moupinense Series

dendrocharis, *Franch.*
moupinense, *Franch.*
petrocharis, *Diels.*

### No. 31. Neriiflorum Series

*Subseries Forrestii*

erastum, *Balf. f. et Forrest.*
Forrestii, *Balf. f.*
porphyrophyllum, *Balf. f. et Forrest.*
repens, *Balf. f. et Forrest.*
serpens, *Balf. f. et Forrest.*

*Subseries Haematodes*

catacosmum, *Balf. f.*
chaetomallum, *Balf. f. et Forrest.*
chionanthum, *Tagg et Forrest.*
coelicum, *Balf. f. et Farrer.*
haematodes, *Franch.*
hemidartum, *Balf. f.*
mallotum, *Balf. f. et Ward* (aemulorum, *Balf. f.*).
pocophorum, *Balf. f.*

*Subseries Neriiflorum*

Albertsenianum, *Forrest.*
euchroum, *Balf. f. et Ward.*
floccigerum, *Franch.*
neriiflorum, *Franch.*
Sub-species :
agetum, *Balf. f. et Forrest.*
euchaites, *Balf. f. et Forrest.*
phaedropum, *Balf. f. et Farrer.*
phoenicodum, *Balf. f. et Farrer.*
sperabile, *Balf. f. et Farrer.*
sperabiloides, *Tagg et Forrest.*

*Subseries Sanguineum.*

aperantum, *Balf. f. et Ward.*
apodectum, *Balf. f. et W. W. Sm.*
citriniflorum, *Balf. f. et Forrest.*
cloiophorum, *Balf. f. et Forrest.*
Sub-species :
asmenistum, *Balf. f. et Forrest.*
leucopetalum, *Balf. f. et Forrest.*
mannophorum, *Balf. f. et Forr.*
roseotinctum, *Balf. f. et Forrest.*
dichroanthum, *Diels.*
didymum, *Balf. f. et Forrest.*
eudoxum, *Balf. f. et Forrest.*
Sub-species :
asteium, *Balf. f. et Forrest.*
brunneifolium, *Balf. f. et Forr.*
epipastum, *Balf. f. et Forrest.*
glaphyrum, *Balf. f. et Forrest.*
mesopolium, *Balf. f. et Forrest.*
pothinum, *Balf. f. et Forrest.*
temenium, *Balf. f. et Forrest.*
trichomiscum, *Balf. f. et Forrest.*
fulvastrum, *Balf. f. et Forrest.*
haemaleum, *Balf. f. et Forrest.*
herpesticum, *Balf. f. et Ward.*
himertum, *Balf. f. et Forrest.*
horaeum, *Balf. f. et Forrest.*
sanguineum, *Franch.*
scyphocalyx, *Balf. f. et Forrest.*
torquatum, *Balf. f. et Farrer.*
trichophlebium. *Balf. f. et Forrest.*

### No. 32. Ovatum Series

Bachii, *Levl.*
hongkongense, *Hutch.*
leptothrium, *Balf. f. et Forrest.*
ovatum, *Planchon.*
Vialii, *Franch.*

### No. 33. Ponticum Series

*Subseries Caucasicum*

adenopodum, *Franch.*
brachycarpum, *G. Don.*
caucasicum, *Pallas.*
chrysanthum, *Pallas.*
Degronianum, *Carrière.*
Fauriei, *Franch.*
hyperythrum, *Hayata.*
Makinoi, *Tagg.*
Metternichii, *Sieb. et Zucc.*
Smirnowi, *Traut.*
Ungernii, *Traut.*
yakusimanum, *Nakai.*

*Subseries Ponticum*

californicum, *Hook.*
catawbiense, *Michaux.*
maximum, *Linn.*
ponticum, *Linn.*

### No. 34. Saluenense Series

calciphilum, *Hutch. et Ward.*
calostrotum, *Balf. f. et Ward.*
chameunum, *Balf. f. et Forrest.*
charidotes, *Balf. f. et Farrer.*
cosmetum, *Balf. f. et Forrest.*
fragariflorum, *Ward.*
keleticum, *Balf. f. et Forrest.*
prostratum, *W. W. Sm.*
radicans, *Balf. f. et Forrest.*
riparium, *Ward.*
saluenense, *Franch.*

### No. 35. Scabrifolium Series

hemitrichotum, *Balf. f. et Forrest.*
mollicomum, *Balf. f. et W. W. Sm.*
pubescens, *Balf. f. et Forrest.*
scabrifolium, *Franch.*
spiciferum, *Franch.*
spinuliferum, *Franch.*

### No. 36. Semibarbatum Series

semibarbatum, *Maxim.*

### No. 37. Stamineum Series

Cavaleriei, *Levl.*
Championae, *Hook. f.*
Esquirolii, *Levl.*
Hancockii, *Hemsley.*
Henryi, *Hance.*

Latoucheae, *Franch.*
leiopodum, *Hayata.*
leucobotrys, *Ridley.*
moulmeinense, *Hook. f.*
oxyphyllum, *Franch.*
stamineum, *Franch.*
stenaulum, *Balf. f. et W. W. Sm.*
Tutcherae, *Hemsley et Wilson.*
Westlandii, *Hemsley.*
Wilsonae, *Hemsley et Wilson.*

### No. 38. Taliense Series

*Subseries Adenogynum*

adenogynum, *Diels.*
adenophorum, *Balf. f. et W. W. Sm.*
alutaceum, *Balf. f. et W. W. Sm.*
Balfourianum, *Diels.*
Bureavii, *Franch.*
Bureavioides, *Balf. f.*
codonanthum, *Balf. f. et Forrest.*
cruentum, *Levl.*
detersile, *Franch.*
detonsum, *Balf. f. et Forrest.*
dumicola, *Tagg et Forrest.*
elegantulum, *Tagg et Forrest.*
Faberi, *Hemsl.*
Faberioides, *Balf. f.*
mimetes, *Tagg et Forrest.*
Prattii, *Franch.*
wuense, *Balf. f.*

*Subseries Roxieanum*

aischropeplum, *Balf. f. et Forrest.*
bathyphyllum, *Balf. f. et Forrest.*
comisteum, *Balf. f. et Forrest.*
cucullatum, *Hand.-Mazz.*
globigerum, *Balf. f. et Forrest.*
gymnocarpum, *Balf. f.*
iodes, *Balf. f. et Forrest.*
lampropeplum, *Balf. f. et Forrest.*
microgynum, *Balf. f. et Forrest.*
perulatum, *Balf. f. et Forrest.*
poecilodermum, *Balf. f. et Forrest.*
pronum, *Tagg et Forrest.*
proteoides, *Balf. f. et W. W. Sm.*
recurvum, *Balf. f. et Forrest.*
Roxieanum, *Forrest.*
russotinctum, *Balf. f. et Forrest.*
triplonaevium, *Balf. f. et Forrest.*
tritifolium, *Balf. f. et Forrest.*

*Subseries Taliense*

aganniphum, *Balf. f. et Ward.*
agglutinatum, *Balf. f. et Forrest.*
Clementinae, *Forrest.*
doshongense, *Tagg.*
flavorufum, *Balf. f. et Forrest.*
glaucopeplum, *Balf. f. et Forrest.*
lophophorum, *Balf. f. et Forrest.*
phaeochrysum, *Balf. f. et W. W. Sm.*
Principis, *Bur. et Franch.*
Przewalskii, *Maxim.*
Purdomii, *Rehd. et Wils.*
schizopeplum, *Balf. f. et Forrest.*
sphaeroblastum, *Balf. f. et Forrest*
syncollum, *Balf. f. et Forrest.*
taliense, *Franch.*
vellereum, *Hutch.*

*Subseries Wasonii*

inopinum, *Balf. f.*
paradoxum, *Balf. f.*
rufum, *Batal.*
Wasonii, *Hemsl. et Wils.*
Weldianum, *Rehd. et Wils.*
Wiltonii, *Hemsl. et Wils.*

### No. 39. Thomsonii Series

*Subseries Campylocarpum*

callimorphum, *Balf. f. et W. W. Sm.*
caloxanthum, *Balf. f. et Farrer.*
campylocarpum, *Hook. f.*
cyclium, *Balf. f. et Forrest.*
hedythamnum, *Balf. f. et Forrest.*
myiagrum, *Balf. f. et Forrest.*
telopeum, *Balf. f. et Forrest.*

*Subseries Martinianum*

eurysiphon, *Tagg et Forrest.*
Martinianum, *Balf. f. et Forrest.*

*Subseries Selense*

calvescens, *Balf. f. et Forrest.*
cymbomorphum, *Balf. f. et Forrest.*
dasycladum, *Balf. f. et W. W. Sm.*
erythrocalyx, *Balf. f. et Forrest.*
Sub-species :
beimaense, *Balf. f. et Forrest.*
docimum, *Balf. f.*
eucallum, *Balf. f. et Forrest.*
truncatulum, *Balf. f. et Forrest.*
esetulosum, *Balf. f. et Forrest.*
jucundum, *Balf. f. et W. W. Sm.*
manopeplum, *Balf. f. et Forrest.*
rhaibocarpum, *Balf. f. et W. W. Sm.*
selense, *Franch.*
Sub-species :
axium, *Balf. f. et Forrest.*
chalarocladum, *Balf. f. et Forr.*
dolerum, *Balf. f. et Forrest.*
duseimatum, *Balf. f. et Forrest.*
metrium, *Balf. f. et Forrest.*
nanothamnum, *Balf. f. et Forr.*
pagophilum, *Balf. f. et Ward.*
probum, *Balf. f. et Forrest.*
setiferum, *Balf. f. et Forrest.*
vestitum, *Tagg et Forrest.*

*Subseries Souliei*

astrocalyx, *Balf. f. et Forrest.*
Bonvalotii, *Bur. et Franch.*
croceum, *Balf. f. et W. W. Sm.*
litiense, *Balf. f. et Forrest.*
puralbum, *Balf. f. et W. W. Sm.*
Souliei, *Franch.*
Wardii, *W. W. Sm.*
Williamsianum, *Rehder et Wilson.*

*Subseries Thomsonii*

cerasinum, *Tagg.*
cyanocarpum, *Franch.*
eclecteum, *Balf. f. et Forrest.*
Hookeri, *Nutt.*
hylaeum, *Balf. f. et Farrer.*
Meddianum, *Forrest.*
Stewartianum, *Diels.*
Thomsonii, *Hook. f.*

**No. 40. Trichocladum Series**

chloranthum, *Balf. f. et Forrest.*
lepidostylum, *Balf. f. et Forrest.*
lithophilum, *Balf. f. et Ward.*
lophogynum, *Balf. f. et Forrest.*
mekongense, *Franch.*
melinanthum, *Balf. f. et Ward.*
oulotrichum, *Balf. f. et Forrest.*
rubrolineatum, *Balf. f. et Forrest.*
semilunatum, *Balf. f. et Forrest.*
trichocladum, *Franch.*

**No. 41. Triflorum Series**

*Subseries Augustinii*

Augustinii, *Hemsley.*
bivelatum, *Balf. f.*
chasmanthoides, *Balf. f. et Forrest.*
chasmanthum, *Diels.*
hirsuticostatum, *Hand.-Mazz.*
trichophorum, *Balf. f.*
villosum, *Hemsley et Wilson.*

*Subseries Hanceanum*

afghanicum, *Aitch. et Hemsley.*
Hanceanum, *Hemsley.*

*Subseries Oreotrephes*

apiculatum, *Rehder et Wilson.*
artosquameum, *Balf. f. et Forrest.*
bracteatum, *Rehder et Wilson.*
oreotrephes, *W. W. Sm.*
sycnanthum, *Balf. f. et W. W. Sm.*
timeteum, *Balf. f. et Forrest.*

*Subseries Polylepis*

Amesiae, *Rehder et Wilson.*
concinnoides, *Hutch. et Ward.*
concinnum, *Hemsley.*
polylepis, *Franch.*
pseudoyanthinum, *Balf. f.*

*Subseries Triflorum*

ambiguum, *Hemsl.*
bauhiniiflorum, *Watt.*

flavantherum, *Hutch et. Ward.*
kasoense, *Hutch. et Ward.*
Keiskei, *Miquel.*
lutescens, *Franch.*
triflorum, *Hook. f.*
Wongii, *Hemsley et Wilson.*

*Subseries Yunnanense*

aechmophyllum, *Balf. f. et Forrest.*
Bodinieri, *Franch.*
charianthum, *Hutch.*
chartophyllum, *Franch.*
Davidsonianum, *Rehder et Wilson.*
eriandrum, *Levl.*
erileucum, *Balf. f. et Forrest.*
hesperium, *Balf. f. et Forrest.*
hormophorum, *Balf. f. et Forrest.*
hypophaeum, *Balf. f. et Forrest.*
leilungense, *Balf. f. et Forrest.*
lochmium, *Balf. f.*
longistylum, *Rehder et Wilson.*
pleistanthum, *Balf. f.*
rigidum, *Franch.*
Searsiae, *Rehder et Wilson.*
siderophyllum, *Franch.*
stereophyllum, *Balf. f. et W. W. Sm.*
suberosum, *Balf. f. et Forrest.*
tatsienense, *Franch.*
Vilmorinianum, *Balf. f.*
yunnanense, *Franch.*
zaleucum, *Balf. f. et W. W. Sm.*

### No. 42. Vaccinioides Series

asperulum, *Hutch. et Ward.*
emarginatum, *Hemsley et Wilson.*
euonymifolium, *Levl.*
insculptum, *Hutch. et Ward.*
Kawakamii, *Hayata.*
Quadrasianum, *Vidal.*
rosmarinifolium, *Vidal.*
vaccinioides, *Hook. f.*
Vidalii, *Rolfe.*

### No. 43. Virgatum Series

oleifolium, *Franch.*
racemosum, *Franch.*
virgatum, *Hook. f.*

### Species Unplaced

asterochnoum, *Diels.*
coeloneurum, *Diels.*
Magorianum, *Balf. f.*
ochraceum, *Rehder et Wilson.*
platypodum, *Diels.*
Potaninii, *Batalin.*
pyrrhoanthum, *Balf. f.*

THE FOLLOWING NOTES HAVE BEEN CONTRIBUTED BY MR. H. F. TAGG, F.L.S., OF THE ROYAL BOTANIC GARDEN, EDINBURGH.

## NOTE ON CERTAIN CHANGES IN THE TENTATIVE LIST OF RHODODENDRONS IN THEIR SERIES IN SO FAR AS THESE CHANGES CONCERN THE ELEPIDOTE SPECIES.

The fourth edition of the "Tentative List of Rhododendrons in their Series" is now in the hands of members. Comparison with the third edition will show that several changes have been made, and it may be of interest if some of the more important changes are briefly explained.

### Arboreum Series.

Previously in Series Arboreum three subseries were recognised—Adenopodum, Arboreum, and Niveum. These have been replaced by two subseries—Arboreum and Argyrophyllum. It was found that the subseries Niveum was very artificial, and part of its contents were transferred to Arboreum subseries, part to Argyrophyllum subseries and part to the Series Fulvum. Rh. adenopodum, which previously formed a centre to the subseries of that name, proves to be very different from the species now grouped around Rh. argyrophyllum. In its inflorescence and indumentum it is much more akin to the Northern Series Ponticum, and it has been transferred to subseries Caucasicum, Ponticum Series. The withdrawal of Rh. adenopodum from its former associates leaves a more homogeneous subseries centring around Rh. argyrophyllum. This subseries is still attached to the Arboreum Series, but there are reasons for the opinion that it may yet find itself an additional subseries of the Taliense Series. The geographical distribution of the subseries Argyrophyllum is in harmony with the proposed change, although in the Tentative List effect has not been given to it.

### Auriculatum Series.

The revision of the Fortunei Series led to the conclusion that Rh. auriculatum was not happily placed in that series. Its nearest affinity is apparently Rh. Griersonianum. A new series has therefore been constituted with these two species as members. The Series Fortunei is on the whole remarkably free from the occurrence of hairs on the shoots and on the foliage, while these are present to a greater or less degree on these two species. Their flower characters are also somewhat divergent from those of the Fortunei Series. The flower bud of the two species in this new series is very characteristic, and is quite unlike that which is generally found in the Series Fortunei.

The position of Rh. Griersonianum has been much discussed. The long tube of the corolla presents a superficial likeness to some of the Stamineums, but essential characters such as the inflorescence are quite different in that series.

RH. AURICULATUM and RH. GRIERSONIANUM are not closely related, but the points in common seem to justify their association as a small series having no very close connection with other members of the genus.

### BARBATUM SERIES.

Several additions have been made to the Series Barbatum. Some of these are new species and some have been transferred from other series. RH. MORII has been brought in from the Irroratum Series. It should be noted that RH. IXEUTICUM has been found to be the same as RH. CRINIGERUM, *Franch.*

### CAMPANULATUM SERIES.

The Series Campanulatum has lost two members. RH. PARISHII finds its nearest affinity without doubt in that section of the Series Irroratum which centres around RH. KYAWI. This Moulmein species comes into line with certain other species of the same section found in Burma or the Chinese areas immediately adjoining. RH. WIGHTII, which was previously placed with some doubt in Campanulatum Series, comes so near to RH. LACTEUM that they quite clearly belong to the same series.

### CHRYSANTHUM SERIES.

Chrysanthum as a series drops out of the new list. The major part of the series as given in the third edition now goes to Ponticum Series, Caucasicum subseries. This is in accord with the characters of the species and also with the geographical distribution. RH. PSEUDOCHRYSANTHUM has been transferred to the Barbatum Series, while ample material, recently secured, of RH. PURDOMII shows that it undoubtedly belongs to the Taliense Series, subseries Taliense.

### FALCONERI SERIES.

The only change in the Series Falconeri is that RH. MEGAPHYLLUM and RH. REGALE have been regarded as equivalent to RH. BASILICUM, and therefore do not appear in the list.

### FORTUNEI SERIES.

The Fortunei Series has been considerably altered, and six subseries appear instead of three. Previously DAVIDII was considered to be near RH. OREODOXA. It is, however, much more akin to RH. SUTCHUENENSE; further, RH. CALOPHYTUM and RH. SUTCHUENENSE are not of close kinship; they differ from one another in foliage and in the shape of corolla. A small subseries has been constituted for RH. CALOPHYTUM and its ally RH. OPENSHAWIANUM. RH. DAVIDII heads a subseries of four members—the species of which differ from those of the subseries Oreodoxa in the much elongated inflorescence and larger foliage. The subseries Fortunei remains very much as in former lists, but the following important changes have to be noted :—

1. In the subseries as given in the earlier list there was included two species which are decidedly aberrant within the subseries. These are RH. ORBICULARE

and Rh. Griffithianum (under which name is now included Rh. Aucklandii). To each has been accorded the rank of a separate subseries.

2. Rh. auriculatum and its claim to series rank along with Rh. Griersonianum is referred to above.

3. Rh. rasile is now regarded as equivalent to Rh. diaprepes, and

4. Rh. hexamerum as a six-lobed form of Rh. decorum.

5. Four of the names appearing as species in the subseries Fortunei in the third edition are now treated as geographical forms of Rh. vernicosum.

6. Rh. planetum previously put in the subseries Fortunei is transferred to the subseries Davidii.

7. Previously grouped with Rh. Davidii were a number of species which in the present list form a separate subseries centring around Rh. oreodoxa.

8. Rh. Limprichtii is an imperfectly known species, and in the meantime is omitted from the list.

### Fulvum Series.

As originally constituted, this included two species only, fulvum and fulvoides. A characteristic feature of the two is the narrow elongate glabrous ovary, which develops into a sickle-shaped fruit. Both have a peculiar and characteristic indumentum, and their relation to other species appeared at first to be somewhat remote. However, in reviewing the characters of the species originally associated with Rh. niveum, it became evident that Rh. niphargum and Rh. uvarifolium in flower and fruit characters were more nearly akin to Rh. fulvum than to any of the members of the Arboreum Series. Also akin is Rh. dendritrichum at one time doubtfully associated with Rh. Metternichii.

### Grande Series.

No important changes have been made in the Series Grande.

### Irroratum Series.

No marked changes have been made in the Irroratum Series, the numerous members of which are in the main obviously akin to Rh. irroratum. One important exception, however, is in that small group of species which are associated with Rh. Kyawi. These are : Rh. agapetum, Rh. Elliottii, Rh. eriogynum, Rh. facetum, Rh. Parishii, and Rh. schistocalyx, and with these would be included Rh. prophantum, but this has been made to equal Rh. Kyawi. This small group has a peculiar stellate indumentum not found in any of the ordinary members of the Series Irroratum. They may yet come to be regarded as constituting a small but quite distinct series. It should also be observed that Rh. eritimum and Rh. lukiangense are species of considerable variability, and include within them several forms which previously had been regarded as distinct species. The minor changes are as follows : Rh. adenostemonum has been reduced to Rh. pogonostylum ; Rh. Annae has been inserted, a species described by Franchet and long overlooked ; Rh. Hardingii is a new species about to be described ; Rh. hylaeum has been transferred to Thomsonii Series ;

Rh. Morii and Rh. nankotaisanense have been transferred to Barbatum Series ; Rh. Shepherdii previously overlooked is here included.

### Lacteum Series.

It has been judged inadvisable to break up the Lacteum Series into two subseries. It is of interest to note that Rh. Wightii is included in this series. Its affinity with Rh. lacteum is undoubted. Certain names have been omitted as follows : Rh. helvolum has been reduced to Rh. levistratum, Rh. intortum reduced to Rh. sigillatum, Rh. theiophyllum reduced to Rh. Traillianum and Rh. vicinum reduced to Rh. levistratum.

### Metternichii Series.

The Series Metternichii has been broken up, and the greater part of it transferred to Series Ponticum. Rh. dendritrichum has been removed to Fulvum Series ; Rh. Fordii to Arboreum Series, Argyrophyllum subseries ; Rh. principis to Taliense Series, subseries Taliense ; Rh. stenophyllum is now known as Rh. Makinoi, and appears under that name in the Ponticum Series.

### Neriiflorum Series.

In Series Neriiflorum no change has been made in the number of subseries. There is no alteration in Forrestii subseries except that that plant of doubtful affinity, Rh. pyrrhoanthum has been removed to the category of "unplaced." In subseries Haematodes the only point of moment is the reduction of Rh. aemulorum to Rh. mallotum. The two are the same, but Rh. mallotum was described first. The only alteration in subseries Neriiflorum is that certain members of the previous list are regarded as subspecies of Rh. neriiflorum. The same remark applies to subseries Sanguineum. Rh. cloiophorum and Rh. eudoxum lead each a group of subspecies. The following have been eliminated : Rh. chlanidotum now equals Rh. citrinflorum, Rh. jangtzowense and Rh. liratum equal Rh. apodectum, and Rh. nebrites and Rh. poliopeplum equal Rh. himertum.

### Ponticum Series.

The Ponticum Series has been considerably enlarged. It now takes in the chief parts of the Series Chrysanthum and of the Series Metternichii. It is clear that the large-leaved Rhododendrons of North America, Europe, and North Asia are closely linked together. The Asiatic members form a subseries grouped around Rh. caucasicum. Rh. adenopodum has been brought in from Arboreum Series ; Rh. Degronianum is the correct name for what has been previously called Rh. Metternichii var. pentamerum ; Rh. hyperythrum is an addition to the series ; Rh. Makinoi is the correct name for what was previously called Rh. stenophyllum, *Hayata* (not *Hook. f.*) ; Rh. yakusimanum is a little known species which almost certainly belongs to this series. Rh. baeticum is treated as a form of Rh. ponticum.

### Taliense Series.

The number of subseries in Taliense Series remains at four, and the names of the subseries are unchanged. As regards subseries Adenogynum the only point of importance is the addition of three new species. Roxieanum subseries except for the addition of Rh. gymnocarpum and Rh. pronum, both recently described, is the same. In the subseries Taliense appear the two new species, Rh. doshongense and Rh. vellereum; Rh. Purdomii previously in Series Chrysanthum is added; Rh. dichropeplum is reduced to Rh. phaeochrysum and Rh. fissotectum is reduced to Rh. schizopeplum; Rh. principis has been introduced from Metternichii Series. Subseries Wasonii remains as it was, but further material may show that Rh. Magorianum should be added to it.

### Thomsonii Series.

In the Series Thomsonii the number of subseries is as before, but the subseries Dasycladum has been broken up, and the subseries Martinianum is substituted. In the subseries Campylocarpum two species appear which have been transferred from the subseries Selense. Rh. Martinianum with a new ally constitute a small but distinct subseries. The subseries Selense has been enlarged, and while it includes species certainly closely akin to Rh. selense, it also includes others such as Rh. dasycladum which are somewhat aberrant. The minor changes are: the addition of a new species, Rh. vestitum, Rh. blandulum is reduced to Rh. jucundum, and Rh. panteumorphum is reduced to Rh. selense. The subseries Souliei has been reduced in size owing to the following changes: Rh. axium, Rh. esetulosum, and Rh. eucallum are transferred to the subseries Selense; Rh. cordatum is reduced to Rh. Souliei; Rh. gleoblastum and Rh. oresterum are reduced to Rh. Wardii; Rh. prasinocalyx is reduced to Rh. croceum. The subseries Thomsonii is also smaller in the number of its members. Rh. aiolosalpinx and Rh. niphobolum are reduced to Rh. Stewartianum; Rh. brachyandrum is regarded as a variety of Rh. eclecteum and Rh. candelabrum is regarded as a variety of Rh. Thomsonii, and Rh. eriphyllum as a variety of Rh. cyanocarpum; Rh. hylaeum is brought in from the Irroratum Series. There is one new species added, Rh. cerasinum.

### Unplaced Species.

A few species appear at the end under the heading "unplaced." These are either of peculiar character or are very imperfectly known. Of the following, adequate material for an appraisement of their position in the genus is not available: Rh. asterochnoum, Rh. coeloneuron, and Rh. ochraceum. Rh. Magorianum formerly attached to the Irroratum Series may on further investigation prove to be allied to members of the subseries Wasonii. The exact placement of the little known Rh. pyrrhoanthum is still quite uncertain.

## RH. METTERNICHII AND TWO OF ITS IMMEDIATE ALLIES.

The name changes, and the synonym adjustments that have been suggested for RH. METTERNICHII and its closely related forms are numerous. In this note I confine myself to RH. METTERNICHII as described by Siebold and Zuccarini and two species in cultivation which have hitherto passed as RH. METTERNICHII or varieties of that species.

### RH. METTERNICHII, *Sieb. et Zucc.*

RH. METTERNICHII, as figured and described by Siebold and Zuccarini, has the parts of the flower in sevens—7 sepals, 7 petals, 14 stamens, 7 chambers in the ovary. As far as I have been able to discover, this is not in cultivation in Britain. There is no seven-partite METTERNICHII in cultivation at Edinburgh, at least none have yet flowered, and I was told a few years ago by Mr. Bean that there were none at Kew. The Herbarium at Edinburgh has specimens of so-called RH. METTERNICHII from other gardens, but none are seven-partite, and all are referable to one or other of the two species referred to below. There is, however, in the Bisset Herbarium at Edinburgh a native specimen which has seven-partite flowers, and agrees in other ways with the description of the species as given in the *Flora Japonica*.

### RH. DEGRONIANUM, *Carrière.*

(RH. METTERNICHII, *Sieb. et Zucc.*, var. PENTAMERUM, *Maxim.*;
RH. JAPONICUM, *Schneider*, var. PENTAMERUM, *Hutch.*)

This is the plant which most commonly passes as RH. METTERNICHII or RH. METTERNICHII, var. PENTAMERUM. There are several plants at Edinburgh which show some variation in habit, in size of leaf, in the degree of recurving of the leaf margin, and in colour and thickness of the indumentum, but all are referable I think to the one species. The best plant is a handsome compact rounded bush. At all seasons it is densely clothed to the ground with attractive foliage, so that the much branched stems are almost hidden in the closely packed glossy green leaves—glossy green on the upper surface, but clad below with a fawn to rufous felty tomentum. The leaves are oblong-elliptic to obovate, 7-15 cm. long, 2-4 cm. broad, generally broadest a little above the middle, and broader for their length than the seven-partite RH. METTERNICHII in the Bisset Herbarium referred to above. The truss is a nicely proportioned one of 10-12 flowers on an axis 1·5-2 cm. long, with flower stalks set oblique or semi-erect. The flowers are of a soft pink with deeper tinted lines outside along the middle of the five petals. Spotting within is absent or is very faint. The rose-pink flowers have an excellent background in the dark green foliage, and the plant at Edinburgh has the added commendations that it is, in most years, very floriferous, and the flowering period is a fairly protracted one. Moreover, the cut truss will stand fresh for at least a fortnight.

Mr. Bean described in his *Trees and Shrubs* a variety of this (var. AUGUSTIFOLIUM), with narrower leaves than the type. Specimens of this Kew variety which Mr. Bean kindly sent to Edinburgh prove that it is certainly a form of RH. DEGRONIANUM, and has nothing to do with the narrow-leaved species referred

to below as RH. MAKINOI. The latter, Mr. Bean says, is not in cultivation at Kew. It is interesting to note that Professor Makino (*Bot. Mag. Tokyo*, x. (1896), 211) refers to a form " AUGUSTIFOLIA " growing in the Botanic Garden of the Tokyo Imperial University. He remarks, " This is an accidental narrow-leaved form which came out of the seeds of RH. METTERNICHII, var. PENTAMERUM." [1]

RH. DEGRONIANUM was described and figured by Carrière in the *Revue Horticole*, xl. (1869), 368, fig. 77. At a later date Maximowicz (in *Rhodo. As. Orient.*, pp. 21-2) referred the same plant to RH. METTERNICHII under the varietal name PENTAMERUM, *Maxim.* This is the plant figured in the *Bot. Mag.* (t. 8403) under the name RH. JAPONICUM, var. PENTAMERUM. True RH. METTERNICHII as represented in the Bisset Herbarium, differs from RH. DEGRONIANUM (1) in the seven-partite flowers, (2) in the longer oblong-oblanceolate leaves with sharper apex, (3) in the thinner less felty and more incrusted indumentum.

Although the name RH. DEGRONIANUM, *Carrière*, antedates that given to the plant by Maximowicz (viz. RH. METTERNICHII, var. PENTAMERUM), its close kinship to RH. METTERNICHII is evident. I follow Professor Nakai in giving its specific rank under its oldest name, but I feel that essentially it has very close kinship with RH. METTERNICHII.

RH. MAKINOI, *Tagg* (RH. STENOPHYLLUM, *Makino*).

We have had at Edinburgh for many years under the name RH. METTERNICHII, var. PENTAMERUM, a number of plants which obviously were very different from RH. METTERNICHII as figured in the *Flora Japonica*, and also distinct from the plants now known as RH. DEGRONIANUM (RH. METTERNICHII, var. PENTAMERUM, *Maxim.*). Mr. Harrow tells me that they were obtained from the Yokohama Nursery Co. under the name RH. METTERNICHII. When Professor Nakai visited Edinburgh some years ago he had no hesitation in identifying these plants as RH. STENOPHYLLUM, described by Makino in the *Botanical Magazine* of *Tokyo*, xxiv. (1910), 99. I then pointed out to him that the specific name " STENOPHYLLUM " had been used by Sir J. Hooker for a Rhododendron from Borneo, briefly described by Burbidge in *Gardens of the Sun* (1880, and more fully described by Stapf in the *Trans. of the Linnean Soc.* (1894-6). Professor Nakai suggested that an appropriate new name would be RH. MAKINOI. It is under this new name (RH. MAKINOI) with myself as sponsor, that it is described by Professor Nakai in his recently published *Trees and Shrubs Indigenous in Japan Proper* (1927).

RH. MAKINOI is not a very handsome plant, but it is certainly a very interesting and a very distinct member of the genus. At Edinburgh it is the last Rhododendron to make its new growths for the year. In September, when RH. DEGRONIANUM has finished its vegetative growth and formed its buds for the winter, RH. MAKINOI is just sending up its young annual growths. It is at this stage that it is most attractive. The shoots and young leaves are at first clad with a white tomentum making a striking contrast to the dark colour of the older leaves and to the other evergreens around it. As the leaves mature the tomentum of

[1] This remark is given in Japanese and I am indebted to Professor Nakai for the translation.

the upper surface falls away, or persists only in the deeply grooved midrib, while that on the under surface and on the stems and petioles turns a tawny or rusty tint, or becomes finally a somewhat drab colour. The leaves are very characteristic. They are narrowly lanceolate in outline, with marked revolute margins, and are curved downwards towards the acute tips, thus assuming a sickle-like form. They recall somewhat the leaves of some of the members of the Roxieanum subseries, a likeness which is increased by the loose woolly character of the tawny indumentum. The flower characters are in general agreement with those of Rh. Degronianum, although the truss is commonly much shorter. At Edinburgh the flowering period, generally June, seems to vary somewhat according to the situation of the plants. It is always later than Rh. Degronianum.

## NOTE ON THE RHODODENDRONS DESCRIBED BY LÉVEILLÉ.

The following comments are based on material in the Herbarium of the Abbé Léveillé. Only those Rhododendrons described by Léveillé as new species are discussed here. The material available is in many cases very meagre. The diagnoses given by Léveillé are very short, and are, moreover, often inaccurate and misleading. However, in certain cases it would appear that the species are valid, and it is therefore worth while giving a definite note on each of the species described. These are enumerated below in alphabetical order. The great majority of his specimens were collected in Eastern Yunnan and Kweichow—areas which are imperfectly explored from a botanical point of view. It is not surprising therefore that part of his material does not correspond with species described from other provinces.

Rh. albicaule, *Lévl.* in *Fedde Repert.*, xiii. (1914), 148.

The material in the *Herb. Lévl.* is=Rh. decorum, *Franch.* Léveillé's description does not fit the specimens well, but there is no other material under that name.

(In *Flore du Kouy-Tchéou*, p. 152, Léveillé cites Rh. albicaulis, *Lévl.* as a synonym of Rh. Cavaleriei, *Lévl.*, a species of the Stamineum Series. This statement is obviously the result of some error, as the specimen under 3923 Cavalerie is Rh. decorum. Moreover, Léveillé's description does not fit in with a member of the Stamineum Series. Whatever Léveillé had in mind at the time, it was presumably a member of the Lepidote Rhododendrons. In any case it is impossible to retain the name Rh. ablicaule.)

Rh. Argyi, *Lévl.* in *Fedde Repert.*, xii. (1913), 102.
=Rh. mucronatum, *G. Don.*

Rh. Bachii, *Lévl.* in *Fedde Repert.*, xii. (1913), 103.

This belongs to Series Ovatum, and may be permitted to stand as a valid species.

RH. BLINII, *Lévl.* in *Bull. Geogr. Bot.*, xxv. (1915), 21.
=pale form of RH. LUTESCENS, *Franch.*

The foliage is in exact accord with that of RH. LUTESCENS, and whitish-yellow flowers of RH. LUTESCENS are not unknown in cultivation.

RH. CAERULEUM, *Lévl.* in *Fedde Repert.* xii. (1913), 284.

This antedates RH. RAROSQUAMEUM, *Balf. f.*, which is equivalent. Under RH. RAROSQUAMEUM is quoted several numbers, and one of these collected by Maire from Motsou is the type plant RH. CAERULEUM.

RH. ERIANDUM. *Lévl.* MSS. (of which no description has been found) is also the same.

RH. CAVALERIEI, *Lévl.* in *Bull. Soc. Agric. Sci. Arts Sarthe* (1903), 48.

This belongs to Series Stamineum. It appears to be a valid species. The material is far from satisfactory.

RH. CHRYSOCALYX, *Lévl. et Vaniot*, in *Fedde Repert.*, nov. sp. ii. (1906), 113.

This has been accepted as valid. The type sheet was seen by Mr. E. H. Wilson and passed. RH. CHRYSOCALYX belongs to the Series Azalea.

RH. CORDATUM *Lévl.* in *Bull. Geogr. Bot.*, xxiv. (1914), 282.

The material of this in the *Herb. Lévl.* is very fragmentary. There is but little doubt that it is RH. SOULIEI, *Franch.*

RH. CRENATUM, *Lévl.* in *Bull. Geogr. Bot.*, xxv. (1915), 20.
=RH. RACEMOSUM, *Franch., forma.*

RH. CRUENTUM, *Lévl.* in *Fedde Repert.*, xii. (1913), 284.

This is akin to RH. BUREAVII, *Franch.*, but is not identical with that species and specific rank seems to be justifiable. It is a member of the Taliense Series, Adenogynum subseries.

RH. DENUDATUM, *Lévl.* in *Fedde Repert.*, xiii. (1914), 339.

A member of the Argyrophyllum subseries, Arboreum Series, closely related to RH. FLORIBUNDUM, *Franch.* It is probably a valid species.

RH. DUCLOUXII, *Lévl.* in *Bull. Soc. Agric. Sci. Arts Sarthe* (1903), 49.

This is undoubtedly=RH. SPINULIFERUM, *Franch.*

RH. ESQUIROLII, *Lévl.* in *Fedde Repert.*, xii. (1913), 103.

This is one of the Stamineum Series. The material is poor, but represents in all probability a valid species.

RH. EUONYMIFOLIUM, *Lévl.* in *Fedde Repert.* xii. (1913), 103.

This belongs to Series Vaccinioides. In all probability a valid species.

RH. FARINOSUM, *Lévl.* in *Fedde Repert.*, xiii. (1914), 340.

This belongs to Arboreum Series, Argyrophyllum subseries. Almost certainly a valid species, and closely akin to RH. FLORIBUNDUM and RH. DENUDATUM.

RH. FEDDEI, *Lévl.* in *Fedde Repert.*, xii. (1913), 103.

The material under this name is a member of the Stamineum Series. It is probably equivalent to one or other of the described species, but the material is too imperfect for determination. It should never have been described, and should be ignored.

RH. FRANCHETIANUM, *Lévl.* in *Bull. Soc. Agric. Sci. Arts Sarthe* (1903), 46.
=RH. DECORUM, *Franch.*

RH. FUCHSIAEFLORUM, *Lévl.* in *Fedde Repert.* xii. (1913), 284.
=RH. SPINULIFERUM, *Franch.*

RH. FUCHSIIFOLIUM, *Lévl.* in *Fedde Repert.*, xiii. (1914), 148.

This belongs to the Series Azalea. The material is so imperfect that no decision can be given.

RH. GIRAUDIASII, *Lévl.* in *Fedde Repert.*, xiii. (1914), 340.
=RH. DECORUM, *Franch.*

RH. HALLAISANENSE, *Lévl.* in *Fedde Repert.*, xii. (1913), 101.

According to Nakai in *Fl. Sylv. Kor.*, viii., p. 47, this=RH. POUKHANENSE, *Lévl.* See also E. H. Wilson, *Monograph of Azaleas* (1921), 65.

RH. JAHANDIEZII, *Lévl.* in *Fedde Repert.*, xiii. (1913), 340.
=RH. SIDEROPHYLLUM, *Franch.*

RH. LECLERII, *Lévl.* in *Fedde Repert.* xii. (1913), 284.
=a form of RH. RUBIGINOSUM, *Franch.*

RH. LEMEEI, *Lévl.* in *Fedde Repert.*, xiii. (1914), 339.
=RH. LUTESCENS, *Franch.*

RH. LEUCANDRUM, *Lévl.* in *Fedde Repert.*, xii. (1913), 103.

This comes very near RH. SIDEROPHYLLUM, *Franch.*, but it has an unusually elongate calyx, and the lepidote scales are not the same in the two species. It is not exactly equivalent to any described species of Triflorum, and may stand meanwhile till further material from its area is available. It is founded on CAVALERIE 1254, which is a mixed gathering. Part of the material is named RH. SEGUINI (which=RH. BODINIERI), but the remaining part is no doubt what Léveillé intended as RH. LEUCANDRUM.

RH. LILIIFLORUM, *Lévl.* in *Fedde Repert.*, xii. (1913), 102.

This is a valid species accepted by Mr. J. Hutchinson in *Notes R.B.G., Edin.*, xii. (1919), 33.

RH. LYI, *Lévl.* in *Fedde Repert.*, xiii. (1914), 147.

This is a valid species accepted by Mr. J. Hutchinson in *Notes R.B.G. Edin.*, xii. (1919), 56.

RH. MAIREI, *Lévl.* in *Fedde Repert.*, xii. (1913), 285.
=RH. LACTEUM, *Franch.*

RH. MAXIMOWICZIANUM, *Lévl.* in *Bull. Soc. Agric. Sarthe* (1903), 47.

This is said by the author to be near RH. SIDEROPHYLLUM, which is however a Lepidote species. The material in the herbarium of the author does not bear out the description. The fragmentary specimens are those of some member of the ITTORATUM Series. The indumentum described by the author is not present on the specimens presumed to be the originals. The species should most fittingly be ignored.

RH. MISSIONARIUM, *Lévl.* in *Bull. Geogr. Bot.*, xxv. (1915), 20.

This is a valid species accepted by Mr. J. Hutchinson in *Notes R.B.G. Edin.*, xii. (1919), 55.

RH. MOTSOUENSE, *Lévl.* in *Fedde Repert.*, xiii. (1914), 148.
=RH. RACEMOSUM, *Franch.*

RH. NANUM, *Lévl.* in *Fedde Repert.*, xii. (1913), 285.
=RH. POLYCLADUM, *Franch.*

RH. POUKHANENSE, *Lévl.* in *Fedde Repert.*, nov. sp., v. (1908), 100.

=RH. YEDOENSE, *Maxim.* var. POUKHANENSE, *Nakai.* See *Tokyo Bot. Mag.*, xxxiv. (1920), 274 ; also E. H. Wilson in *Monog. Azaleas*, p. 65.

RH. REX, *Lévl.* in *Fedde Repert.*, xiii. (1914), 340.

This belongs to the Falconeri Series, and has good claim to be considered a distinct species.

RH. RUBRO-PUNCTATUM, *Lévl. et Vaniot* in *Fedde Repert.*, ix. (1911), 448.
=RH. BODINIERI, *Franch.*

RH. SEGUINI, *Lévl.* in *Fedde Repert.*, xiii. (1914), 148.

According to Léveillé himself this is=to RH. RUBRO-PUNCTATUM, *Lévl. et Vaniot.* This is correct, and is therefore=RH. BODINIERI, *Franch.*

RH. SPINIGERUM, *Lévl.* in *Bull. Geogr. Bot.*, xxiv. (1914), 251.

There is no material under this name in *Herb. Lévl.*, but the author reduces this species in *Fl. du Kouy-Tchéou*, p. 152, to RH. CHRYSOCALYX, *Lévl. et Vaniot.*

RH. TAPELOUENSE, *Lévl.* in *Bull. Geogr. Bot.*, xxv. (1915), 20.
=RH. TATSIENENSE, *Franch.*

Rh. Taquetii, *Lévl.* in *Fedde Repert.*, xii. (1913), 101.
=Rh. dauricum, *Linn.* var. mucronulatum. See *Journ. Arn. Arb.*, iv., p. 50.

Rh. umbelliferum, *Lévl.* in *Fedde Repert.*, xii. (1913), 102.

This belongs to Series Azalea. The material is poor and the validity of the species is very doubtful.

Rh. Vaniotii, *Lévl.* in *Fedde Repert.*, xiii. (1914), 148.

There is no separate material in the *Herb. Lévl.* under this name, but from the number cited and from the description—such as it is—it is equivalent to Rh. Esquirolii, *Lévl.*

Rh. xanthoneuron, *Lévl.* in *Fedde Repert.*, xiii. (1914), 340.
=Rh. denudatum, *Lévl.*

## THE OCCURRENCE OF RHODODENDRON SPECIES IN BHUTAN, COLLECTED BY R. E. COOPER IN 1914 AND 1915.

CONTRIBUTED BY R. E. COOPER.

Sikkim is famous as the earliest home of Rhododendrons and eastward, across the Chumbi Valley which lies along Sikkim's eastern border, is a strip of similarly mountainous country called Bhutan.

Bhutan covers the southern slopes of the Himalayas for about 300 miles, and stretches a phalanx of valleys and spurs south for 50 miles from the clusters of snow peaks on the main chain, to the *dooars* of Bengal.

There are three regions—the western valleys running south from the big cluster of peaks dominated by Chumolhari; the central valleys whose heads ramify from a cluster of peaks due north of Punakha; and the eastern valleys which lie in the shelter of another set of huge snow peaks guarding the gap in the Himalayas through which the Kuru Chu flows from Tibet into India.

The lowest elevation at which any Rhododendron was found, was in red sandy soil, beneath *Pinus longifolia* forest, at an elevation of 3000 feet; in the valley of one of the eastern streams, the Kuru Chu. The species being the common RH. ARBOREUM, and not likely to be hardy, was not collected but merely noted. The highest growing species was RH. SETOSUM, which ranged above 15,000 feet. A companion species, outstripped only in the last few hundred feet nearer the snows, was RH. NIVALE. This may now be seen growing in the Edinburgh Botanical Garden (Rock Garden), the only plant in cultivation from the highest growing species.

Certain species were common throughout Bhutan in similar conditions. The LEPIDOTUMS, SETOSUMS, and ANTHOPOGONS, are found on the land above tree-level; the CAMPANULATUMS and VIRGATUMS in the highest forests of spruce, birch, and juniper; the GRANDES, TRIFLORUMS, and EDGEWORTHIIS in the lowest regions to have snow in the winter; while lowest of all, in the warm valleys without snow are the plants not hardy in this country except in favoured spots, the ARBOREUMS and DALHOUSIAE.

Between the lowest record from 3000 feet and the highest from the vicinity of 16,000 feet there grows a set of plants whose altitudinal habitats are indicated in the accompanying tables.

Of the three regions, the western valleys have a similar distribution of high elevation flora to their neighbouring valleys of Sikkim. There is the scattered occurrence of ARBOREUMS and MADDENIIS at the first definite change of the vegetation from the subtropical to the subtemperate indicated by the appearance of oaks and magnolias. A little higher, big clumps and thickets of tall growing GRANDES and HODGSONIIS appear in moist mossy forest. At the first appearance of moist conifers—*Abies* as opposed to dry conifers, *pinus excelsa*—the tall and often moss-covered species of Rhododendron thin out, and drifts of CINNABARINUM, WALLICHII, WIGHTII, and CAMPANULATUM appear in the undergrowth. The bush forms of CAMPANULATUM and WIGHTII reach to the first open hillsides

which the tree forms have declined to clothe, but here they prefer the sheltered slopes.

Ranging above even the sheltered slopes and adorning the rounded turf-clad crowns of the lower ridges that look out over the deep valleys, and are in turn overlooked by the high and aloof, rock and ice pinnacles of the mountain-tops, are the dwarf bushes of the species of NIVALE, SETOSUM, LEPIDOTUM, and ANTHOPOGON. These form continuous stretches on the first low moors, but plants of these species are driven gradually—with increasing elevations—to seek the hollows, and finally to live their life in the shelter provided by the gaps between big boulders of the moraine.

A definite feature of the covering of the highest treed and shrubby slopes in the valleys of Bhutan is the occurrence of any species at higher elevations on the south-east facing exposures than on any other.

On the timber line of the slopes of a rising valley that lifts its head to the primula-studded moors, grey screes, and glittering snowfields, spruce forest will be seen running thin. The trees, getting more and more scattered and dwarfed, will be seen, however, growing on eastern facing slopes several hundred feet higher than on the slopes across the valley, which may have only a few scattered junipers.

The development of Rhododendron species, which from being shrubs under trees become full light bearers through the fading away of the tree forms, follows similar lines.

RH. CAMPANULATUM, CINNABARINUM, and WIGHTII develop a continuous covering to the hillsides, draping the slopes and old moraines into graceful sweeps and contours of verdure in a most pleasant fashion. Gaps in the mantle there are, usually due to waterlogging of the soil, where a sort of fairy ring may be decked out with primulas; or a terrace covered with the meandering waters of a small spring will provide a contrast with clumps of *Allium* and *Primula*, both *sikkimensis*, rising from the grey slabs of rock half immersed in the water.

In the region of ANTHOPOGONS such wet terraces are populated with *Prim. involucrata*, while *Primula sapphirina* will stud with blue, any peat nodules that may be about.

The Central Valleys are the uppermost reaches of the valleys north of Punakha and Tongsa. The folk who live in these valleys are able, by withdrawing bridges from the few places where the precipitous cliffs allow descent to the water's edge, to keep out would-be visitors from the south.

The people themselves visit the capital to pay tribute during the winter when the streams are no longer swollen by the summer rains or melting snows and can be forded. A visit to the upper reaches meant a more elaborate outfit than I could carry, and was therefore abandoned.

Each valley was partly penetrated, however, one to 9000 feet, and the other to 5000 feet, but the area was not particularly profitable.

Tongsa's Valley was not visited, but the next valley to it was traversed throughout. This was Pumthang, and although it is included in the eastern

valleys, this valley gave an excellent indication of what was across the ridge. The ridge flora was poor and uninteresting.

The eastern valleys yielded RH. THYODOCUM from 12,000 feet, ARGIPEPLUM from 10,000 feet, and KENDRICKII from 8000 feet, as the most interesting records of new and rare plants in a region where the disposition of the common species of the genus became similar in quantity and range to the western valleys.

So much for the general range and the extremes of the genus ranging up the valleys.

The valleys of Bhutan develop an arid tendency in places, usually about elevations of 7000 to 9000 feet, where the hitherto steep-sided gorges from the south open out to wide valleys. The majority of the inhabitants live in these places, and the air being dry and the soil reddish and sandy, pines—*P. excelsa*—are the greater wear for the surrounding slopes up to certain limits. Connecting these habited areas of the valleys, a track traverses the country from east to west, crossing the dividing spurs at elevations about 10,000 feet. There seems to be something about the elevation of 9500 feet which induces rain, because in the most arid and pine-clad of valleys, a moist flora develops at this elevation on the side hills. This means that the tops of the ridges separating valleys are crowned with moist forest, and in this Rhododendrons, of course, are found.

Interesting records include BRACHYSIPHON at 7000 feet, EPAPILLATUM at 6000 feet, KEYSII at 8000 feet, DALHOUSIAE at 6000 feet, MADDENII at 7000 feet, POLYANDRUM at 8000 feet, VACCINIOIDES at 9000 feet, and such epiphytic species as RHABDOTUM at 9000 feet, and COOPERI at 9000 feet.

That the arid valleys have no effect on the range of species may be judged from the list showing the occurrence of species in the eastern, central, and western valleys.

A feature of the distribution of Rhododendron species in Bhutan was that as in Sikkim, the greatest quantities of these plants are found on the east and south-east aspects of the main Chola groups; so in Bhutan, much more Rhododendron country was found south-east of the big Chumolhari group and the big group of snows which, according to the map, lies north of Punakha, and another big group by the gap through which the Kuru Chu flows.

Of species newly discovered but not necessarily in cultivation, there is HAEMONIUM, a dwarf shrub of the ANTHOPOGON type from the higher moors of 13,000 feet, with yellow flowers, found only in the western valleys, and two other high elevation plants—RH. THYODOCUM, a 3-foot sprawling bush with purple flowers from 13,000 feet, and RH. ARGIPEPLUM, a 6-foot bush from 11,000 feet, with red flowers remarkable for a mass of white hairs in the open throat. These last two are only found in the eastern valleys.

RH. PAPILLATUM is a 6-foot bush from the spruce forests of the western valleys of 11,000 feet, bearing pale-cream flowers frilled at the edges, with a blood-red blotch in the throat and scattered pink spots on the lip. RH. KENDRICKII was only found in fruit at 9000 feet, but was effectively decorative through the crinkled edges of its long narrow leaves; looking more like a Holly than a Rhododendron.

RH. RHABDOTUM was the showiest of the whole set both new and old. A 12-feet bush growing on dry rock faces, the flowers look very like a cross between a RH. DALHOUSIAE and an *Ipomoea* from the reflexed rim of the trumpet and the red lines running down the outside of the corolla tube to the peak of the petals. Found growing at 8000 feet, it would be hardy only in the south of England. Only one collection of this plant is on record, and that was in flower, so that it has yet to be introduced and established.

Taking Hooker's note on the journey to the Chola Pass in November 1849 of the order of ascension of Rhododendron species in the Sikkim hills, it is found to be very applicable to the range of the species on the Bhutan hills.

At 6000 feet in Sikkim.—DALHOUSIAE, CAMELLIAEFLORUM, ARBOREUM, VACCINIOIDES, *adding* for Bhutan—BRACHYSIPHON, GRIFFITHIANUM, EPAPILLATUM, POLYANDRUM.

At 8000 feet in Sikkim.—{ARGENTEUM / GRANDE} FALCONERI, BARBATUM, EDGEWORTHII, CAMPBELLIAE, NIVEUM, *adding* for Bhutan—ARGIPEPLUM, KENDRICKII, COOPERI, KEYSII, SMITHII, RHABDOTUM, VACCINIDOIES.

At 10,500 feet in Sikkim.—LANATUM, VIRGATUM, CAMPYLOCARPUM, *adding* for Bhutan—CILIATUM, HODGSONII, CAMPANULATUM.

At 12,000 feet in Sikkim.—LEPIDOTUM, FULGENS, WIGHTII, ANTHOPOGON, SETOSUM, *adding* for Bhutan—THYODOCUM, HAEMONIUM, TRIFLORUM, OBOVATUM, ELAEAGNOIDES, NIVALE.

Has the direction or moisture content of the wind anything to do with the higher ranging on certain definite slopes? Does the bedding of the rock belts which are tilted in one direction throughout the country affect the soil's composition and consistency? Who will venture an opinion when it is known that the winds travel up the valley and hillside for most of the day, and blow down the high hill slopes from the snows during the night? I can only testify from bitter experience that the air on these high slopes throughout the growing season for plants, from May to September, is a succession of blanketings of mist, sleet, and heavy rain, hastening before or with, bitterly cold winds.

The angle of dip of the rock beds is about 30 degrees to the north-west, the beds running north-east to south-west. This brings the broken ends of the stratas on to the east facing or western side of the valleys, and those seem to be better for growing plants than the full rock face that underlies the thin layer of debris on the eastern slopes.

## PLANTS IN CULTIVATION FROM COOPER'S SEED.

The most interesting plants in cultivation at Edinburgh are Nos. 1805 OBOVATUM from 13,000 feet, 2224 THYODOCUM of 14,000 feet, 2148 LANATUM of 12,000 feet, 3482 SETOSUM of 15,000 feet, 3483 NIVALE of 15,000 feet, 3485 ANTHOPOGON of 13,000 feet, 3492 WALLICHII aff. of 12,000 feet, all alpines and rock-garden plants.

RH. NIVALE grows happily and well, producing quantities of flowers every year in the Edinburgh Botanic Garden (Rock Garden), where it is grown on top

of a ridge exposed to all winds except those from the south-west (Edinburgh's most severe wind to plant growth if the prevailing slant of trees is any guide). This aspect will suit all the high elevation plants.

The other numbers include 2088 HODGSONII from 10,000 feet, 2315 and 3615 GRIFFITHIANUM of 6000 feet, 3505 THOMSONII of 10,000 feet, 3506 COOPERI of 9000 feet, 3507 SMITHII of 7000 feet, 3541 TRIFLORUM of 9000 feet, 3588 VIRGATUM of 9000 feet, 3601 BRACHYSIPHON of 9000 feet, 4978 KENDRICKII of 9000 feet, and 2922 a CINNABARINUM which has produced yellow flowers, all requiring protection in the winter, except in the warmer counties and exposures.

The numbers which have been referred to as affinities of CAMPANULATUM, CINNABARINUM, and ARBOREUM are from plants which seemed to show sufficiently distinct variation in the field to warrant collecting.

## OCCURRENCE OF SPECIES IN THE VALLEYS ACCORDING TO ELEVATION.

| ELEVATION. | WESTERN VALLEYS. Paro and Timpu. | CENTRAL VALLEYS. Punakha and Tongsa. | EASTERN VALLEYS. Pumthang and Kuru Chu. |
|---|---|---|---|
| 15,000 ft. | setosum, nivale | | |
| 14,000 ft. | lepidotum, campanulatum | ... | elaeagnoides, thyodocum, lepidotum |
| 13,000 ft. | setosum, lepidotum, Wallichii, anthopogon, fulgens, haemonium, Wightii, obovatum, campanulatum, thyodocum, campylocarpum, triflorum | ... | campanulatum, thyodocum |
| 12,000 ft. | lepidotum, virgatum, Wallichii, lanatum | ... | Wallichii, campanulatum, setosum, thyodocum, cinnabarinum, fulgens, lanatum |
| 11,000 ft. | barbatum, cinnabarinum, lepidotum, campylocarpum | ... | argipeplum |
| 10,000 ft. | cinnabarinum, pendulum, epapillatum, barbatum, arboreum, campanulatum, virgatum, Thomsonii, Cooperi, camelliaeflorum, Smithii, Keysii, Hodgsonii | grande, barbatum, cinnabarinum, Smithii | Hodgsonii, arboreum, Thomsonii argipeplum, lanatum |

| Elevation. | Western Valleys. Paro and Timpu. | Central Valleys. Punakha and Tongsa. | Eastern Valleys. Pumthangand KuruChu. |
|---|---|---|---|
| 9,000 ft. | virgatum, triflorum, barbatum, Maddenii grande, Falconeri | Edgeworthii, virgatum, argentum, Keysii, rhabdotum, Cooperi, vaccinioides, grande | Cooperi, Kendrickii |
| 8,000 ft. | arboreum, Keysii, polyandrum, virgatum | Griffithianum, grande | salignum, Griffithianum |
| 7,000 ft. | arboreum, Maddenii, Griffithianum, virgatum, Smithii | arboreum, brachysiphon, Maddenii | |
| 6,000 ft. | arboreum, Maddenii, brachysiphon, Griffithianum, Dalhousiae, epapillatum | Dalhousiae, grande | |

## FIELD COLLECTING RECORDS OF RHODODENDRON SPECIES FROM BHUTAN IN THE EAST HIMALAYA, MADE BY ROLAND EDGAR COOPER IN 1914 AND 1915.

| Date. | Region and Elevation. | | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|---|
| 6.7.1914 | Timpu Valley | 6,000 ft. | 1291 | arboreum | |
| 6.7.14 | ,, | 6,000 ft. | 1292 | Maddenii | |
| 8.7.14 | ,, | 8,500 ft. | 1454 | polyandrum, *Hutch.* | New sp. 3 ft. bush, white flrs. |
| 8.7.14 | ,, | 8,500 ft. | 1456 | Keysii aff. | 4 ft. bush, tubular orange flrs. |
| 12.7.14 | ,, | 8,500 ft. | 1516 | virgatum aff. | |
| 13.7.14 | ,, | 13,000 ft. | 2552 | lepidotum | Dwarf |
| 13.7.14 | ,, | 12,500 ft. | 3064 | R. virgatum | On west side ridge |
| 15.7.14 | ,, | 7,000 ft. | 1545 | arboreum aff. | |
| 15.7.14 | ,, | 8,000 ft. | 1547 | virgatum | |
| 16.7.14 | ,, | 9,000 ft. | 1575 | arboreum | |
| 24.7.14 | Philey La., India —Tibet divide | 13,000 ft. | 1805 | obovatum aff. | Flrs. purple, 4 ft. bush |
| 26.7.14 | Timpu Valley | 12,000 ft. | 1937 | cinnabarinum | In fruit, only 10-15 ft. |
| 27.7.14 | ,, | 12,500 ft. | 1960 | campanulatum | 3 ft. bush, with brown underleaf, flrs. light to dark purple |
| 28.7.14 | ,, | 13,000 ft. | 2590 | Wightii | |
| 28.7.14 | ,, | 13,000 ft. | 2592 | campanulatum | |
| 29.7.14 | ,, | 10,000 ft. | 2928 | Thomsonii | |
| 29.7.14 | ,, | 10,500 ft. | 3256 | cinnabarinum | |
| 29.7.14 | ,, | 10,000 ft. | 3257 | Smithii | |
| 30.7.14 | ,, | 10,000 ft. | 2475 | arboreum | In fruit only |
| 30.7.14 | ,, | 12,000 ft. | 2489 | Wallichii aff. | |
| 30.7.14 | ,, | 10,000 ft. | 2503 | Wallichii | |
| 30.7.14 | ,, | 10,000 ft. | 2504 | campylocarpum aff. if flowers yellow | |
| 30.7.14 | ,, | 9,000 ft. | 2505 | Hodgsonii | |
| 30.7.14 | ,, | 10,500 ft. | 2581 | cinnabarinum | |
| 4.8.14 | ,, | 13,000 ft. | 2490 | setosum | |
| 5.8.14 | ,, | 13,000 ft. | 3233 | campanulatum, *Don* | |
| 5.8.14 | ,, | 13,000 ft. | 3234 | Wightii, *Don* | |
| 5.8.14 | ,, | 13,000 ft. | 3235 | thyodocum | |
| 5.8.14 | ,, | 13,000 ft. | 3236 | lepidotum | |
| 5.8.14 | ,, | 13,000 ft. | 3238 | Wallichii aff. | |
| 6.8.14 | ,, | 10,000 ft. | 2922 | cinnabarinum | A plant raised Bot. Gard., Edin., from seed under this number has proved to be R. Cooperi, but must be an odd escaped seed |
| 6.8.14 | ,, | 10,000 ft. | 2924 | arboreum | |
| 7.8.14 | ,, | 10,000 ft. | 2648 | camelliaeflorum aff. | |

| Date. | Region and Elevation. | | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|---|
| 8.8.1914 | Timpu Valley | 10,000 ft. | 3346 | virgatum | |
| 10.8.14 | ,, | 10,000 ft. | 3383 | Keysii | |
| 11.8.14 | ,, | 9,000 ft. | 3423 | Maddenii | |
| 13.8.14 | ,, | 12,000 ft. | 2523 | lepidotum | |
| 24.8.14 | Upper Mo Chu (Punakha) Valley | 9,000 ft. | 2756 | Edgeworthii | |
| 24.8.14 | ,, | 7,500 ft. | 2760 | arboreum, *Sm.* | |
| 26.8.14 | ,, | 9,000 ft. | 2903 | arboreum, *Sm.* | |
| 26.8.14 | Mo Chu Valley | 9,000 ft. | 3151 | virgatum | |
| 27.8.14 | ,, | 7,000 ft. | 2843 | arboreum | |
| 9.9.14 | Punakha and Tongsa Valley divide | 10,000 ft. | 2040 | grande, *Wt.* | 20 ft. bush in fruit |
| 13.9.14 | Pumthang Valley | 10,000 ft. | 2088 | Hodgsonii, *Hk. f.* | 20 ft. bush in fruit |
| 13.9.14 | ,, | 10,000 ft. | 2089 | arboreum, *Sm.* | 10 ft. bush in fruit |
| 22.9.14 | ,, | 12,500 ft. | 2146 | cinnabarinum | 6 ft. bush in fruit |
| 22.9.14 | ,, | 12,500 ft. | 2147 | Wallichii aff. | 8-10 ft. bush in fruit, leaf red below |
| 22.9.14 | ,, | 12,500 ft. | 2148 | lanatum | 8-10 ft. bush in fruit, strongly veined leaves |
| 22.9.14 | ,, | 12,500 ft. | 2149 | Wallichii aff. | In fruit under junipers |
| 22.9.14 | ,, | 12,500 ft. | 2154 | cinnabarinum | In fruit below spruce |
| 23.9.14 | ,, | 13,000 ft. | 2217 | campanulatum | 9 ft. bush in fruit |
| 23.9.14 | ,, | 14,000 ft. | 2223 | elaeagnoides | 1 ft. bush in fruit |
| 23.9.14 | ,, | 14,000 ft. | 2224 | thyodocum | 2 ft. bush in fruit |
| 23.9.14 | ,, | 12,500 ft. | 2233 | Hodgsonii | 10-20 ft. bush in fruit |
| 7.10.14 | Tongsa Valley | 8,000 ft. | 2315 | Griffithianum | 10-15 ft. shrub in fruit |
| 25.10.14 | Bhutan—Tibet divide (south side) | 14,000 ft. | 3479 | lepidotum | 1 ft. shrub in fruit |
| 25.10.14 | ,, | 14,000 ft. | 3480 | campanulatum, *Don* | 2 ft. shrub, growing with 3479 leaves rufous below, but twigs glabrous, seeds blue |
| 25.10.14 | ,, | 15,000 ft. | 3482 | setosum | In seed the smallest and reaching the highest elevations of any Rhod. |
| 25.10.14 | ,, | 15,000 ft. | 3483 | nivale | 6 in. to 1 ft. high, in fruit |
| 26.10.14 | ,, | 13,000 ft. | 3484 | campanulatum | Leaf and twig and fruit woolly, 6 ft. bush in fruit, *rare* |
| 26.10.14 | ,, | 13,500 ft. | 3485 | anthopogon | 1-2 ft. bush in fruit |
| 26.10.14 | ,, | 14,000 ft. | 3487 | .. | Fragments of a bush in fruit |
| 26.10.14 | Timpu Valley | 13,000 ft. | 3490 | campanulatum | 6 ft. bush in fruit, leaf woolly below |

| Date. | Region and Elevation. | | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|---|
| 26.10.1914 | Timpu Valley | 13,000 ft. | 3491 | campylocarpum | 10 ft. elongated shrub in fruit, entirely glabrous |
| 26.10.14 | ,, | 13,000 ft. | 3492 | Wallichii aff. | 10 ft. bush, leaf with brown coarse hairs above, scattered black hairs below |
| 26.10.14 | ,, | 13,000 ft. | 3493 | cinnabarinum | 10 ft. bush in fruit, leaf oblong-ovate, 2 × ¾ in., purple-pink gland dotted above, pitted below |
| 27.10.14 | ,, | 14,000 ft. | 3498 | campanulatum | 5 ft. bush on western slopes only, in fruit |
| 30.10.14 | ,, | 8,000 ft. | 3503 | arboreum | Leaf silver below, 10 ft. bush in fruit |
| 30.10.14 | ,, | 10,500 ft. | 3505 | Thomsonii | 10 ft. bush in fruit |
| 30.10.14 | ,, | 10,500 ft. | *3506 | Cooperi, *Bf. f.* | 6 ft. bush in fruit only, with golden glands below leaf |
| 30.10.14 | ,, | 10,500 ft. | 3507 | barbatum, *Smithii* (?) | Coarse scattered hairs on fruits and young growths |
| 30.10.14 | ,, | 13,000 ft. | 3527 | campanulatum, *Don* | Cf. No. 3528, which it resembles but bears better seed |
| 4.11.14 | ,, | 13,000 ft. | 3528 | campanulatum, *Don* | Pure orange under leaf, in fruit |
| 4.11.14 | ,, | 13,000 ft. | 3540 | arboreum | 20 ft. bush, reddish-silvery under leaf, in fruit |
| 4.11.14 | ,, | 13,000 ft. | 3541 | triflorum | 10 ft. bush in fruit, leaf silvery below, buds pink |
| 7.11.14 | Paro Valley | 11,000 ft. | 3569 | lepidotum | Small bush in fruit, on sandy peat banks ; leaves long-lanceolate and scented |
| 15.11.14 | ,, | 9,000 ft. | †3588 | virgatum aff. | Bush 1-3 ft. in fruit, in moss over gravel |
| 15.11.14 | ,, | 8,500 ft. | 3693 | arboreum aff. | Leaves wider than usual |
| 18.11.14 | Timpu Valley | 6,000 ft. | 3601 | brachysiphon | 10 ft. straggly bush in fruit, coppery tinged below leaf |
| 18.11.14 | ,, | 6,000 ft. | 3615 | Griffithianum | 12 ft. bush bearing large fruits, perhaps 1292 |
| 22.4.1915 | ,, | 5,000 ft. | 3786 | arboreum | 15 ft. bush under oaks, firs. red with brown spots inside |

* Flowered in Botanic Garden, Edinburgh, in 1924 as Rh. Cooperi, *Balf. f.*
† Flowered in April 1920 in Botanic Garden, Edinburgh.

| Date. | Region and Elevation. | | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|---|
| 22.4.1915 | Timpu Valley | 6,000 ft. | 3806 | Dalhousiae | 8 ft. bush, flrs. primrose-yellow |
| 22.4.15 | ,, | 6,700 ft. | 3807 | Griffithianum | 10 ft. bush, smooth bark, flrs. pure white |
| 22.4.15 | ,, | 6,700 ft. | 3809 | Griffithianum | Similar to 3807, but bark is not smooth and the flrs. are tinged with red |
| 22.4.15 | ,, | 7,000 ft. | 3815 | virgatum | Small bush, flrs. pink |
| 22.4.15 | ,, | 6,500 ft. | 3816 | epapillatum | 17 ft. tree, flrs. pale pink with red spots |
| 22.4.15 | ,, | 7,000 ft. | 3818 | Smithii | 4 ft. shrub, red flrs., hairy petioles |
| 24.4.15 | ,, | 7,000 ft. | 3819 | cinnabarinum | 6 ft. bush, long orange flrs. |
| 29.4.15 | Paro Valley | 10,000 ft. | 3830 | aff. Hodgsonii (?) sp. nov. | 20 ft. bush, below Abies forest, flrs. purple, leaf bronzed below |
| 22.4.15 | ,, | 9,000 ft. | 3831 | triflorum | 2 ft. straggly bush on limey soil, below *pinus excelsa*, flrs. yellow |
| 29.4.15 | ,, | 9,000 ft. | 3833 | arboreum | 10-15 ft. bush, flrs. red, edged white, leavessmaller, acute, not so silvery |
| 3.5.15 | Bhutan—Tibet divide | 14,500 ft. | 3838 | nivale | Flrs. deep purple, on peat turf, dwarf |
| 4.5.15 | Paro Valley | 12,000 ft. | 3851 | Wallichii | 6 ft. bush, flrs. beautiful pale helio, leaves light green below, scabrid, polished dark green above |
| 4.5.15 | ,, | 10,000 ft. | 3855 | .. | Dwarf shrub in lee of rocks, leaves, small, hairy, flrs. yellow |
| 5.5.15 | ,, | 10,500 ft. | 3873 | cinnabarinum | 6 ft. bush under oak forest, flrs. orange to half yellow and pure white |
| 5.5.15 | ,, | 12,000 ft. | 3874 | lanatum aff. | 6 ft. bush under birch forest, flrs. yellow, under leaf densely woolly brown |
| 5.5.15 | ,, | 11,000 ft. | 3875 | campylocarpum | 10 ft. bush in oak forest, flrs. yellow with orange tinge in centre of petals |
| 5.5.15 | ,, | 10,000 ft. | 3876 | pendulum | 2 ft. bush hanging on mossy rock faces, petals white with red lips |

| Date. | Region and Elevation. | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|
| 5.5.1915 | Paro Valley (from a temple altar offering) | 3879 | Edgeworthii | Flrs. white, scented, leaves hairy, brown below, corrugated above |
| 10.5.15 | ,, 10,000 ft. | 3885 | papillatum, *Bf. f. et Cpr.* | Bush under spruce forest, flrs. pale cream, frilled edges, blood-red blotch at base of lower petal, fading out to scattered pink spots |
| 15.5.15 | Timpu Valley 9,500 ft. | 3897 | Falconeri | 20-25 ft. in mixed forest, flrs. creamy-white, viscid, with dark purple blotch in the throat, leaves 9 × 4 in., dark green above, rufous beneath |
| 15.5.15 | ,, 13,000 ft. | 3903 | haemonium. *Bf. f. et Cpr.* | Dwarf shrub on hill-tops, flrs. yellow |
| 15.5.15 | ,, 13,000 ft. | 3904 | Wightii | 4 ft. bush, yellow flrs. |
| 15.5.15 | ,, 13,000 ft. | 3905 | fulgens | Dwarf bush on peat, flrs. pure red, leaves entirely glabrous |
| 15.5.15 | ,, 13,000 ft. | 3906 | campanulatum | 2 ft. bush, flrs. magenta-purple, leaves fawny, woolly below |
| 21.5.15 | Timpu—Punakha divide 9,200 ft. | 3911 | grande. *Wt.* | 12 ft. bush, flrs. pink, leaf silvery brown below, 8 in. long |
| 21.5.15 | ,, 9,000 ft. | 3913 | Keysii | 8 ft. bush, flrs. long, tinged orange to green |
| 27.5.15 | Punakha Valley 6,500 ft. | 3935 | Dalhousiae | 8 ft. bush in fruit, in steep dry hillside |
| 27.5.15 | ,, 7,000 ft. | 3936 | brachysiphon, *Bf. f. et Cpr.* | 8 ft. bush, pink, scented, flrs. on steep dry hillside |
| 29.5.15 | ,, 9,000 ft. | 3937 | rhabdotum, *Bf. f. et Cpr.* | 2 trees of 12 ft., on dry rock faces, flrs. long, cream with crimson lines down them, similar perhaps to 3935 |
| 29.5.15 | ,, 8,000 ft. | 3939 | Griffithianum | 20 ft. bush in fruit |
| 29.5.15 | ,, 8,000 ft. | 3940 | grande, *Wt.* | 10 ft. bush, in moist scrub, large leaf and silvery below, growing together with 3939 |
| 6.6.15 | ,, 7,000 ft. | 3957 | Maddenii | 5 ft. bush on dry hillside, flrs. white, with pink lines and yellow, throat scented |

| Date. | Region and Elevation. | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|
| 6.6.1915 | Punakha—Tongsa divide 9,000 ft. | 3959 | Cooperi, *Bf. f.* | Epiphyte on big mossy trees, small bush, flrs. red with glandular spots |
| 8.6.15 | ,, 10,500 ft. | 3968 | grande, *Wt.* | 10 ft. bush in mixed scrub, flrs. purple, leaf large, with silvery tomentum below |
| 10.6.15 | Tongsa Valley 9,000 ft. | 3982 | vaccinioides aff. | 6 in. shrub at edge of oak forest, flrs. pink, small |
| 15.6.15 | Pumthang Valley 10,000 ft. | 3987 | lanatum | Bush 20 ft., with pale pink flrs. and pinky brown wool beneath leaf |
| 18.6.15 | ,, 10,000 ft. | 3990 | campanulatum aff. | A rare bush, 8 ft., in fruit, leaves with white tomentum below, turning red when mature |
| 18.6.15 | ,, 10,000 ft. | 3991 | Thomsonii | 12 ft. bush, very common, in fruit |
| 19.6.15 | ,, 12,000 ft. | 4003 | setosum | Dwarf bush, with profuse purple flrs., common in peat meadows |
| 19.6.15 | ,, 12,000 ft. | 4009 | thyodocum, *Bf. f. et Cpr.* | A 3 ft. bush, with lax habit, flrs. purple |
| 20.6.15 | ,, 12,000 ft. | 3998 | cinnabarinum aff. | 15 ft. bush in spruce forest, with absolutely plain yellow flrs,, flrs. not typical |
| 1.7.15 | ,, 9,500 ft. | 4083 | Cooperi, *Bf. f. et Cpr.* | Small 4 ft. bush, epiphytic in mossy trees, flrs. wide open, white inside, pink outside, leaves glandular below and green above |
| 1.7.15 | ,, 10,000 ft. | 4084 | Hodgsonii | Large bush in fruit, silvery under leaf |
| 1.7.15 | ,, 9,000 ft. | 4086 | Kendrickii, *Nutt.* | A 20 ft. spare bush, in dried flr. and fruit, leaves long, narrow, and glabrous, with crenulating edge |
| 2.7.15 | ,, 12,000 ft. | 4101 | fulgeus aff. | 10 ft. bush in fruit, below Abies |
| 2.7.15 | ,, 13,000 ft. | 4102 | campanulatum aff. | 4 ft. bush, with white flrs. |
| 5.7.15 | ,, 11,000 ft. | 4115 | argipeplum, *Bf. f et Cpr.* | 6ft. bush, remarkable for white lining of hairs below leaf, in fruit and dried flrs. |

| Date. | Region and Elevation. | | Cpr.'s Field No. | Name. | Details. |
|---|---|---|---|---|---|
| 12.7.1915 | Pumthang Valley | 8,000 ft. | 4128 | salignum | Small 1 ft. shrub, with yellow flrs., on steep cliff faces |
| 14.7.15 | ,, | 12,500 ft. | 4120 | Wallichii aff. | 8 ft. bush, especially hairy and woolly |
| 23.7.15 | ,, | 10,000 ft. | 4149 | argipeplum, *Bf. f. et Cpr.* | Bush in red flr., with hairy leaves |
| 23.7.15 | ,, | 9,000 ft. | 4160 | Kendrickii | 25 ft. shrub in fruit, leaf narrow, with holly-like edge |
| 30.7.15 | Kerted Valley | 12,000 ft. | 4246 | aff. campanulatum (?) | 6 ft. bush by lake, with *blue* flrs., only seen here |
| 2.8.15 | ,, | 13,000 ft. | 4285 | thyodocum | Small 4 ft. bush in fruit |
| 2.8.15 | ,, | 14,000 | 4286 | campanulatum | 4 ft. bush among boulders, flrs. pink |
| 15.9.15 | Tongsa Valley | 9,000 ft. | 4804 | cinnabarinum | 10 ft. bush in fruit, beneath *Pinus excelsa* forest |
| 20.9.15 | ,, | 10,000 ft. | 4830 | Smithii | 12 ft. bush in fruit |
| 9.15 | Pumthang | 9,000 ft. | 4978 | Cf. 4086, Kendrickii | Bush in fruit, growing beneath spruce and alder, leaf edge like holly |
| 9.15 | Punakha | 9,000 ft. | 4979 | cinnabarinum, cf. Cooperi | Small bush, flrs. red |
| 9.15 | Tongsa | 7,000 ft. | 4980 | Cf. 3957, Maddenii | In fruit |
| 9.15 | ,, | 8,000 ft. | 4981 | Cf. 3833, arboreum | 12 ft. bush, under oak forest |
| 9.15 | ,, | 9,000 ft. | 4982 | cf. cinnabarinum aff., cf. Cooperi | 2 ft. bush, on dry hillsides |

## RHODODENDRON SPECIES AND COOPER'S NUMBERS.

| | |
|---|---|
| Cooperi, *Bf. f.* | 3506, 3959, 4083, 4979, 4982. |
| Dalhousiae, *Hk. f.* | 3806, 3935. |
| Edgeworthii, *Hk. f.* | 2756, 3879. |
| elaeagnoides, *Hk. f.* | 2223. |
| epapillatum, *Bf. f. et Cpr.* | 3816. |
| Falconeri, *Hk. f.* | 3897. |
| fulgens, *Hk. f.* | 3905, 4101. |
| grande, *Wt.* | 2040, 3911, 3940, 3968. |
| Griffithianum, *Wt.* | 2315, 3615, 3807, 3809, 3939. |
| haemonium, *Bf. f. et Cpr.* | 3903. |
| Hodgsonii, *Hk. f.* | 2088, 2505, 2233, 3830, 4084. |
| Kendrickii, *Nutt.* | 4086, 4160, 4978. |
| Keysii, *Nutt.* | 1456, 3913, 3383. |
| lanatum, *Hk. f.* | 2148. 3874, 3987. |
| lepidotum, *Wall.* | 2523, 2552, 3236, 3479, 3569. |
| Maddenii, *Hk. f.* | 1292, 3423, 3957, 4980. |
| nivale, *Hk. f.* | 3483, 3838. |
| obovatum, *Hk. f.* | 1805. |
| papillatum, *Bf. f. et Cpr.* | 3885. |
| pendulum, *Hk. f.* | 3876. |
| polyandrum, *Hutch.* | 1454. |
| rhabdotum, *Bf. f. et Cpr.* | 3937. |
| salignum, *Hk. f.* | 4128. |
| setosum, *Don.* | 2490, 3482, 4003. |
| Smithii, *Nutt.* | 3257, 3818, 4830. |
| Thomsonii, *Hk. f.* | 2928, 3505, 3991. |
| thyodocum, *Bf. f. et Cpr.* | 2224, 3235, 4009, 4285. |
| triflorum, *Hk. f.* | 3541, 3831. |
| vaccinioides, *Hk. f.* | 3982. |
| virgatum, *Hk. f.* | 1516, 1547, 3064, 3151, 3346, 3588, 3815. |
| Wallichii, *Hk. f.* | 2147, 2149, 2489, 2503, 3238, 3492, 3851, 4120. |
| Wightii, *Hk. f.* | 2590, 3234, 3904. |

## COPY OF A LETTER FROM SIR ISAAC BAYLEY BALFOUR TO MR. R. E. COOPER.

ROYAL BOTANIC GARDEN, EDINBURGH,
*18th September* 1916.

DEAR MR. COOPER,—I am afraid I have treated you not well in the way of correspondence and reports upon your collections, and now that I am writing I won't enter upon explanations. Suffice it that I have not forgotten you, nor have your collections been forgotten. The work in connection with them has been great, far greater than I anticipated, because your area of collecting has so intimate a relation to the region of Himalaya further west that I have been compelled, in order to get some basis for discrimination of forms, to take up the whole Indian species of the genera I have been specially looking at, namely Rhododendron and Primula. Clarke in the flora of British India has simply avoided critical work and taken the easy path of slumping allied forms in one big aggregate,

and then Pax has done little to clear up the tangle of the Primulas. My advance therefore has not been rapid, but what I have done so far has brought out facts of great interest, and in both the genera your collections are most valuable and enlightening. First of all, let me deal with your Rhododendrons :

I have described two new species up till now.

No. 4115 Rh. ARGIPEPLUM—so called because of the wonderful white tomentum to which you call attention on the underside of the leaf. It has bristles on the stems, and petioles, like BARBATUM, and belongs to its series. You did not get very good flowers of it, but they sufficed for description.

No. 3903 Rh. HAEMONIUM—so called from the blood-red indumentum of the leaf underside. This plant is of particular interest. I take it Mr. Clarke, and Indian botanists generally, would have called it ANTHOPOGON. But it is not that species, and compelled me to make a study of the whole ANTHOPOGON series in which Mr. Clarke has contained about half a dozen distinct species. Your plant is a beautiful yellow-flowered one. In the result I find—and this is of interest to you in your new sphere of work—that the plant called ANTHOPOGON by Don is a south-western Sikkim and Nepal species with pink or white flowers. The ANTHOPOGON of the north-west Himalaya is a yellow-flowered plant, and distinguished by having circlets of persistent leaf-bud scales over the branches at the base of each annual growth. It is a new species. It is not ANTHOPOGON. You will doubtless find it in your Kulu exploration. Please note if you find any plant like ANTHOPOGON which has not the scales I have mentioned. I have called this north-western Himalayan plant HYPENANTHUM. Your HAEMONIUM is like it, but differs in wanting the persistent scales. This is a very satisfactory piece of work, the result of your exploration. Possibly HAEMONIUM occurs also in north and east Sikkim, but I have not yet been able to tackle that question. There are other novelties in your collection, but I have not yet got their characters worked out and put on paper. Apart from the novelties you have got some fine species which, if you have seeds of them, will be new to cultivation. I shall enclose with this a list of your Rhododendron numbers grouped in relation to the aggregate species with which they are identical, or to which they are allied. Looking at it :

The ARBOREUM lot has one or two distinct forms, notably one with short broad leaves (3593), and one with curious woolly leaves (2089).

The CAMELLIAEFLORUM lot is new to cultivation, and we have seedlings of 3506. I think amongst them is the LUCIDUM of Nuttall, hitherto only a name.

The CAMPANULATUM lot has many different types. And here let me say that you should look at the CAMPANULATUMS of the north-west Himalaya. Possibly they are not the Eastern form.

The DALHOUSIAE set includes one wonder. A large flowered plant (3937) with red stripes up the corolla like an Ipomaea. I know nothing like it. You have not much material of it, and there are no fruits or seeds on the specimens. Perhaps you have seed otherwise.

The GRIFFITHIANUM are not all true GRIFFITHIANUM—one is a large-leaved, the other a small-leaved type—probably new. The large-leaved Rhododendrons

which I group under "Large-Leaved" in the list are an interesting lot. I hope you have the true Grande, which is different from the Sikkim ARGENTUM. Besides HODGSONII you have one or two other species, and these I am trying to correlate with the Bhutan forms collected by Booth and named by Nuttall, which are now sunk in other species. Your plants ought to throw much light upon the large-leaved forms.

It is delightful to have RH. NIVALE, and we have it growing well. I wish we had also OBOVATUM, unknown since Hooker's time and despised by Indian botanists.

RH. PENDULUM is a great find, unseen apparently since the middle of last century. You have no seeds on your dried specimens. I hope Mr. Bully may have some. It is epiphytic, and may be difficult to grow—but dearly to be wished for.

I am glad you have so many of the LEPIDOTUM series with the species so long confused with it, ELAEAGNOIDES and SALIGNUM. I quite think you have one new species in this lot.

Then what I speak of, THOMSONII aff., is a plant that I don't think can be THOMSONII, and there is no other known species it can be. I am hopeful of a new species here.

VACCINIOIDES is a joy. How I hope you have seed of it. There is none on the specimens. It is a gem for cultivation.

WALLICHII aff. includes several forms to be differentiated.

The difficulty in too many cases of your specimens is that being only fruiting, one hesitates to risk naming. And one hopes for living plants. We have seedlings of a number. The figures underlined red are of species we are growing from your seeds. Several have failed to germinate, and I am having seeds taken in those cases from the dried plants for resowing. Your photographs have been helpful, and will be of more help yet when I get set down to final describing of new species.

Now then, let me turn to Primula :—

First of all your 5118 is *P. rosea*, your 5119 is *P. elliptica*. The latter has many forms, and is not in general cultivation—if it is now to be found anywhere.

You will long ere this reaches you have got my response to your question about *P. Traillii* in the copy of our *Notes*. I quote there all that Watt says about his plant. If you get seed of it, and introduce it, your find will be great, for Watt tells me it is a fine species, and his specimens don't belie the statement.

In the north-western Himalaya are several most attractive Primulas and species, which it is much to be desired that we should have in cultivation, because they have been so confused with eastern Himalayan species. I look with much interest to your account of your impression of the Primula flora in the two regions. You will see in the copy of *Notes* that is gone to you reference to the following north-western new form :—*glandulifera*—a small species; *Harrissii*—like *rosea*—but I fear out of your area, as will also be the other members of the *rosea* complex, *rhodantha*, *rosiflora*, *elegans*, and *radicata*, but you should look out for forms of

*rosea*—see what I say under *Harrissii* in the *Notes*; *tanupoda* is a curious little thing like *tibetica*. Of the species of old described from the north-west, you should specially look for the true *rotundifolia* of Wall (often epiphytic); *Clarkii* we know almost nothing of; the north-western Himalayan *sibirica* is not the true Tibetan plant; then most interesting would it be if you got the true *obtusifolia* of Royle—there is no *obtusifolia* in eastern Himalaya—the plant found there is *Roylei* or *Gammieana*, Royle found his plant at Kunewar; in the *petiolaris* lot you will have a big field, and all are worthy collecting and recording for station, for under the name *petiolaris* some dozen species are confused; the whole *purpurea* series, of which there are many varieties, also deserve attention; high up you should get *minutissima*; forms like *erosa* and *erosioides* are also from the north-west, and they differ very markedly from ordinary *denticulata*; you may also come across *floribunda* in many forms, and its elucidation, in view of many cultural variations, may be facilitated by your gatherings. The area is said not to be so rich as the eastern, but that may be from faulty observation. The chief point to focus your attention on from the geographical standpoint is: how do the north-west plants differ from the eastern ones? Very like they may be, but in most cases there is first a difference in allied forms which should be recognisable on the spot. It may be worth your while to look carefully at the *involucrata* series, because the north-western ones are not, first, the eastern, and then there is a curious form of it with calyx split to the base so as to be nearly polypetalous, which some say is a monster, others say not.

But for the holocaust at the Printers to the Stationery Office, which consumed an edition of our *Notes* ready for issue, as well as portions of others on the way, descriptions of many others of your plants would have been published by now. A few days' time ought to see a further number full of Primulas issued, and it will go to you whenever it comes out. There are half a dozen new species of yours in it, and I have yet more to describe. Some of your Bhutan plants are splendid—*P. eburnea* like *P. Reidii*, of which you send also a photograph, must be a beautiful plant. *P. Dianae* (like *P. Kingii*) is also fine. *P. oreina*, the little dwarf, like *dryadaefolia* or *bella*, is a beauty. *P. Xanthopa* with its bright yellow star eye is also a lovely plant. I have had for the moment to drop Primulas in order to get out some Rhododendrons for Mr. Williams, who has been pressing me, but I hope soon to be able to return to them and describe your remaining fine species.

All the photographs, both of Rhododendrons and Primulas, have been useful in helping diagnosis. I shall send them all to Mr. Bully when I have done with them.

The "Scroph" you sent me as unknown at Calcutta, turns out to be a new *Buddleia*, which has taken you as name-father and the *Boragineous* plant is an *Onosma* also described by Mr. Smith—*O. paniculatum*—not hitherto known in Himalaya.

Now I think I better not tire you any further just now. I shall write again ere long when I am able to send you copies of our further publications. I hope you will have really good success in the north-west. It has been eclipsed by Sikkim, but I am sure undeservedly, and that you will show this to be the case, I trust. Hoping you are well and enjoying your leave, and with kind regards,—I am, yours,

ISAAC BAYLEY BALFOUR.

## NOTE FROM BORDE HILL.

I find that of the larger flowered Rhododendrons, RH. DILATATUM stands the most frost. The blossoms here on a plant are perfectly uninjured by nine degrees the other night, and this plant is in the open, *i.e.* not under a tree.

Another matter I have noted is that the flowering of Rhododendrons or not depends largely on the temperature when they are making their growth; if it is warm and sunny, then the bushes are crowded with flower-buds, if cold, few or no flower-buds are formed: it would be interesting to know if any one had ever noticed the mean temperature when Rhododendrons were making growth, and then noted the sequel during the following spring.

STEPHENSON R. CLARKE.

BORDE HILL, 1928.

## NOTES ON RHODODENDRONS AT HEADFORT.

These are a few notes on Rhododendrons growing at Headfort, and as in one instance I have perhaps adopted a slightly unusual method of growing them, it may be of interest, I hope. About four years ago I conceived the idea, when making some improvements in the pleasure ground at Headfort, of building a rock bed, not a rockery, and this was planted chiefly with Rhododendrons of the dwarfer kinds, though in some cases the plants have flourished so well, I have been forced to move them on account of the size to which they have grown. In most cases I adopted the principle of planting from 3 to 6 of a kind, and in one or two cases more, particularly so in the case RH. KELECTICUM. Of this species I planted 12 plants in a space a yard and a half square. Planted two years ago, they now cover the whole area and are one mat, and very attractive when they are in flower.

The following is a list of the plants growing in this rock bed, and the approximate size only: RH. CANTABILE, 3 planted together about 14 inches high and well furnished; RH. SEMANTEUM, 1½ feet by 2 feet; RH. CYCLIUM, 2½ feet by 3½ feet (this is getting too large for its place); RH. RUSSATUM, 1½ feet by 1½ feet; RH. MACROSTEMON, 12 inches by 2 feet 6 inches; RH. HYPENANTHUM, CEPHELANTHUM, ANTHOPOGON, DASPETALUM, CHRYSEUM—all single plants about 15 inches by 2 feet.

Of the SARGUINEUM SERIES the following are all plants of about 1 to 1½ feet by the same width: RH. CHAETOMALLUM, DIDYMUM, ROSEOTINCTUM.

RH. HAEMATODES, 18 inches by 3 feet; RH. HAEMALEUM the same. One of my treasures is a plant of RH. REPENS on the north side, which is 2 feet 6 inches across each way, and I am glad to say covered with buds. A large plant of RH. DICHROANTHUM, which I fear may have to go soon, 2 feet high and 4 feet 6 inches through, has not yet flowered.

RH. IMPEDITUM, 5 inches by 18 inches across each way, a very nice plant. RH. NERRIIFLORUM caps the higher part of this rock bed about 3 feet by 5 feet, flowers well every year. Amongst many others are RH. HUMICOLA, 12 inches by 8 inches. RH. HIPPOPHAEOIDES, 12 inches by 8 inches, a nice set of RH. MOUPINENSE plants. RH. TAPETIFORME small as yet, TELMATEUM several plants; RH. ORTHOCLADUM several, a fine plant of RH. CALOSTROTUM, 12 inches by 20 inches. RH. MYRTILLOIDES, 8 inches by 24 inches across. RH. CAMPYLOGYNUM, 1 foot by 1 foot; RH. POCOPHORUM, 6 inches by 12 inches. RH. MEGERATUM 6 plants, which are slightly inclined to be cut by spring frosts, and a very lovely deep blue form of RH. ORESBIUM.

There are many other smaller plants of Rhododendrons, rare heaths and a few gaultherias. I have many species of crocuses, daffodils, tulips, erythronium, iris, orchis, and other bulbous plants growing amongst them, also primulas and Meconopsis. In all cases the approximate sizes which I have stated are first height and then breadth.

HEADFORT.

*March*, 1929.

## NOTES FROM WAKEHURST.

At the conclusion of my Note last December (1927) I alluded to the fall of snow and blizzard we were then experiencing. Its consequences were deplorable. Nothing inflicts so much damage as wet snow accompanied by a wind; broad-leaved evergreens have to carry great weights, branches and indeed whole specimens are broken to the ground. Rhododendrons are brittle and consequently they suffered severely, especially those which do not curl their leaves.

But 1928 had further trials in store; after a mild February there came frosts in March and again late in April which destroyed so much blossoms that many wondered what there would be to send to the Rhododendron Show. Yet somehow or other that event produced a wonderful display which will no doubt be adequately described by others. The old Hall of the Royal Horticultural Society was filled, and it is pretty certain that in the coming year the exhibits will expand sufficiently to test the capacity of the New Hall. The summer was fairly kind to Rhododendrons until August, when a drought of some weeks set in, which was very trying especially to the seedlings.

Lastly, in November two severe gales which in some parts of the country were more disastrous than any experienced for at least half a century, made havoc of many gardens; uprooted trees and broken branches smashed many valuable Rhododendrons along with other shrubs.

All this makes a woeful record, and as if to omit no plague, the year 1928 produced a new pest afflicting Rhododendrons. A full scientific description will appear in the *Journal* of the Royal Horticultural Society in due course, but a brief account of it may be given here. In May (1928) leaves of Rh. Jacksonii infested with "White Fly" were received at Wisley from a garden at Ascot (it was afterwards found to have attacked Rh. ponticum as well). On being submitted to the authorities at the British Museum it was found to be a new species of "White Fly" (*Dialeurodes*), and was named *Dialeurodes chittendeni*. It is feared that its attacks may be more serious than those of the Rhododendron bug (*Stephanitis Rhododendroni*), although so far it has only been observed on species with smooth leaves.

The first sign of attack is a mottling of the older leaves on the under surface, on which the larvae feed. From April to June the upper surface of the leaves become drenched with vast quantities of honey-dew excretion which provides a suitable medium for growth of sooty moulds.

The best remedies seem to be picking off the affected leaves or spraying. These failing, the only course is to destroy the plant.

In spite of this somewhat doleful retrospect of 1928, the outlook is encouraging, the Rhododendron Association has already justified its existence and now consists of nearly 200 members. The Rhododendron Show of 1929 will be organised and held under its auspices, and there is every sign that the cultivation of the genus is becoming more popular every year.

GERALD W. E. LODER.

*December* 28, 1928.

## PENJERRICK GARDEN.

Mr. Barclay Fox's garden at Penjerrick has two claims to fame—for its own beauty and for the hybrid Rhododendrons that it has produced.

As for the first, the house stands, within view of the sea, at the top of a sloping hollow lawn, flanked by great trees that shade fine groups of Rhododendrons, and ending in a wooded dell where trees and Rhododendrons are yet more closely planted.

The garden achieves its beauty without apparent effort. One is not in the least conscious of any striving after effect, yet the ground has evidently been laid out originally by an owner of great taste and knowledge.

The Rhododendrons seen to-day have, however, with few exceptions, been planted by the present head gardener, Samuel Smith, since his appointment in 1889, but in this planting the tradition of the original maker of the garden has been well maintained. The sweep of the lawn has been left clear ; the Rhododendrons shaded by the trees are of a scale even with trees as they grow at Penjerrick ; there is interest and variety without overcrowding or fuss.

The success of the recent planting is perhaps due in part to the fact that the Rhododendrons, which are the main under planting, are kept in the nursery, not only until they are big enough to flower regularly but, above all, until they are big enough to be in scale with the large trees beside and beneath which they are to grow. Such a procedure is of course only possible where the new planting is restricted within comparatively small limits, and where the intention is to produce an effect rather than to make an extensive or complete collection of many different kinds. At Penjerrick, too, such procedure carries with it this corollary —that no plant shall leave the nursery unless it has the merit to shine in a most distinguished company. How many plants have failed to pass the test I do not know, but I know that few have passed it that were unworthy, for the head gardener has a keen eye for a good flower, and a ready bonfire for a bad one.

When a Rhododendron is planted out great care is taken in the preparation of an ample hole, and the plant receives frequent top dressings. This, with the deep soil and climate that obtain at Penjerrick, brings about a general air of well-being in the plants.

One other thing has contributed to the effectiveness of the planting. Perhaps two-thirds of the Rhododendrons are of but five kinds—ARBOREUMS and the home-raised hybrids BARCLAYI, PENJERRICK, CORNISH CROSS, and LILIANII.

In appraising the value of these hybrids one has, first of all, to decide whether one's ideal Rhododendron bloom must have, in the words of the catalogue, "a well-filled conical truss." If that is a *sine qua non*, one visits Bagshot and not Penjerrick. On the Show bench, other things being equal, the conical truss has it—as any one must admit who has struggled to display effectively in a vase a single truss of BARCLAYI or PENJERRICK, with its curving stem and drooping bells. But on the plant the shower of drooping bells, where one t

seems to melt into the other, has a beauty, so the writer would urge, that is unobtainable with the other type of flower.

To adduce a proof, let us leave Penjerrick for a moment and turn to that other Cornish garden where there are to be seen, growing to great perfection, practically all the Rhododendron species that are known to cultivation, as well as the best of the hybrids.

Here, there is a Rhododendron uninteresting in shape, good but not specially good in its flower colour, with a lop-sided truss whose bells droop in every direction, which, when it is in flower, puts into the shade every other Rhododendron on the place—it is Rh. ORBICULARE, and a substantial part of its beauty is due to the hanging flowers.

Take three other beautiful species—Rh. FARGESII, WILLIAMSIANUM, and CALLIMORPHUM; much of the effect again is due to the fact that the flowers droop.

Now the hybrids BARCLAYI, PENJERRICK, and CORNISH CROSS, are essentially of the class with the drooping truss, and in the writer's view they gain and do not lose from this.

BARCLAYI is the result of crossing GLORY OF PENJERRICK (a bright red form of Gill's hybrid between Rh. BLOOD-RED ARBOREUM and Rh. AUCKLANDII) with Rh. THOMSONII. Unfortunately the THOMSONII blood has not made BARCLAYI any hardier than its parent, GLORY OF PENJERRICK, and with its early growth and flower it requires a garden of Cornish climate to make it really happy. But the beauty of the big deep red shining bells make it well worthy of wall or greenhouse shelter in colder districts.

Three specially good forms have been named ROBERT FOX, ELLEN M. FOX, and AVICE, the latter paler in colour and not perhaps so effective as those of richer hue.

The form—ROBERT FOX—has been propagated by grafting both at Penjerrick and by Messrs. Veitch of Exeter, and whether it is that this form be hardier in itself than the bulk, or whether the PONTICUM stock by retarding the growth, or otherwise, has some effect on it, I do not know, but I have certainly found these grafted plants to be much better doers than others from the original seed bed.

The hybrid named PENJERRICK was bred from Rh. AUCKLANDII with Rh. CAMPYLOCARPUM as pollen parent. Others have made the same cross or the reverse cross. It has been made, I believe, at Caerhays, at Leonardslea, and at Lamellen, where the lovely deep red hybrid GILIAN is believed to be of this parentage.

The PENJERRICKS of Penjerrick are however all of pale tints—pale yellow (only a shade paler than CAMPYLOCARPUM itself), pale pink, white flushed pink, yellow flushed pink, and white itself. The buds are of a deeper colour than the expanded flowers, and in some forms the bells are over four inches across. The plants are quick-growing and free-flowering, with pale green leaves, looking a little sparse perhaps when out of flower, because the old leaves are not retained

very long. They are a little early in flower and growth to suit a "frost hole," but otherwise they proved quite hardy.

If the writer were confined to growing one hybrid Rhododendron he would, without hesitation, grow PENJERRICK.

CORNISH CROSS is RH. THOMSONII crossed with RH. AUCKLANDII. It is very vigorous and hardy. It has large orbicular leaves and red blooms 4¼ inches across, lightened in some cases with a paler tint.

The plants are a very level lot, and it takes an expert eye to pick one that is better than another.

The colour, unlike that of BARCLAYI, is on a white foundation, and from a distance the plant is not so brilliant as that hybrid or as LILIANII, but the size, substance, and shape of the bloom place it very high. Indeed, all these three hybrids are remarkable for the substance and shape of the individual bloom, which has no crinkle in the petal or frilling at the edge.

LILIANII is a cross between a blood-red RH. ARBOREUM growing at Penjerrick and Gill's hybrid SHILSONII (RH. BARBATUM × RH. THOMSONII) as pollen parent. It has the qualities and defects of ARBOREUM. The leaves are very fine, and of a deep green, long retained ; the plant is upstanding, hardy, and a good grower. It flowers most freely everywhere but in North Wales ; the flowers are a brilliant red, of varying shades in the different forms ; the truss is fairly compact, but the ARBOREUM blood prevents the flowers from being quite of such substance as are those of the hybrids previously mentioned.

There is a very fine late flowering form of this hybrid, which should be specially useful in the colder districts.

A large batch of these plants was raised, and a number of the surplus seedlings were obtained by Messrs. Gill, who were the first to show it, and did so under the name CORNUBIA.

These are the hybrids that predominate at Penjerrick, and a great show they make, BARCLAYI and LILIANII in great numbers flowering early in the season, with PENJERRICK and CORNISH CROSS to follow.

The other hybrids raised at Penjerrick should be mentioned, though they are less well known. Three plants of RH. ARBOREUM × RH. BARBATUM are known as ARBOREUM WEREI, and are judged by Mr. Millais to be the best pink of the ARBOREUM type—the BARBATUM blood shows but little. It is one of a big batch of ARBOREUM seedlings raised at Penjerrick.

TREGEDNA (RH. THOMSONII crossed with a pink form of RH. ARBOREUM as pollen plant) is a very good hybrid, with finely shaped red flowers in a very compact truss, with splendid foliage, upright in habit and perfectly hardy. Apparently only a few plants were raised, and the original plants no longer exist at Penjerrick.

There is a fine plant, however, at Lanarth which is conspicuous for its beauty, although in very select company.

Lastly, there is a small batch of BUDOCK—a hybrid from THOMSONII, the pollen parent being a deep red hybrid from AUCKLANDII.

This is said by the raiser to have the best truss of any of his seedlings. It is a plant too tender for anything but a Cornish climate, growing very early, and with buds not too resistant to frost. It has a high truss of good light red colour.

Samuel Smith has only raised all told eleven Rhododendron crosses. Apart from the successful ones already mentioned, one—LADY ALICE FITZWILLIAM × KEYSII, was a curiosity merely. One—ARBOREUM (blood-red) × AUCKLANDII, was discarded owing to war conditions. One—THOMSONII × CAMPANULATUM, proved to be of no great merit. Another—THOMSONII GRANDIFLORA × CAMPYLOCARPUM, was first exhibited by Veitch under the name of EXMINSTER.

The plant of THOMSONII that was used as a parent in several of these hybrids is a good bright form, but in no way remarkable—at anyrate to the inexpert eye. The AUCKLANDII was a specially good and large-flowered form, itself raised at Penjerrick among a batch of seedlings from a plant that came originally from Menabilly.

The large proportion of successes out of so small a number of crosses constitutes a most remarkable record, the more remarkable because the raiser of these hybrids had no knowledge of the science of heredity, and he had necessarily but rare opportunities of visiting other gardens, of discussing his work with other hybridisers, or of obtaining pollen from far afield. Close observation of the qualities of a flower, and fine judgment in selecting the parents, have evidently been the mainspring of this success.

It was only fitting that Samuel Smith's work in raising Rhododendron hybrids should have been recognised by the Royal Horticultural Society in 1929 by the award to him of a Veitch Memorial Medal.

Finally, a brief mention must be made of some noteworthy plants of other genera at Penjerrick. The huge tree of *Laurelia serrata* is unique, *Laurus camphora*, and the *Anopteris glandulosa* are represented by fine specimens, while the rare conifers *Fitzroya patagonica*, *Podocarpus chilensis*, and *Araucaria Bidwillii* have few plants their equal in the country.

*Dacrydium Franklinii*, *Pinus insignis*, *P. Montezumae*, and *P. Teocote* are also noteworthy, and big plants of the two best Magnolias—*M. Campbellii* and *M. conspicua*—are worth going a long way to see when they are in flower.

In fine, those who, by Mr. Barclay Fox's ready courtesy, visit his Penjerrick garden—and they are many—may deem themselves most fortunate in having so fine an object lesson to show how a garden should be planted, and how Rhododendrons should be mated.

HENRY D. McLAREN.

BODNANT, 1928.

## NOTES FROM LAMELLEN.

Second week in February Rh. "ADENARB" (ADENOGYNUM × BLOOD-RED ARBOREUM) produced its first flowers. A large rounded truss of 17 flowers, 2 × 3 inches, campanulate, 5-lobed crimson-carmine (*Rep. de Coul.*) style and filaments paler, stamens 10 light brown, stigma red, darker spotting on the upper lobes. Leaves 5½ × 1¾ inches, dull green above, substantial greyish tomentum beneath, stiff, leathery, on a short peduncle, 1 inch. A stiff sturdy little bush, rather spreading in habit, and there were 4 flowers on a 2-foot specimen—a satisfactory hybrid. Rh. ADENOGYNUM, also produced a nice hybrid with ARBOREUM album, formerly described; but when its pollen was put on Rh. THOMSONII, the resulting hybrid, though of good habit and foliage, had flowers of a somewhat unsatisfactory colour.

First week in March Rh. "CALLIRHOE" (DR. STOCKER × BLOOD-RED ARBOREUM) had a rounded truss of 20 flowers, 2 × 2½ inches, campanulate, 5-lobed, rose Neyron red 3rd shade, style and filaments paler, stamens 10 brown, stigma red. A prettily waved and shaded flower, darker on the exterior, and with crimson spotting over a lighter background on the upper lobes. Quite a nice thing, and better than others of this cross which have flowered previously.

At the same time bloomed a plant of DR. STOCKER × CAMPYLOCARPUM, sister to the yellow previously described, and named Rh. "DAMARIS." Rounded truss of 11 flowers, 2⅛ × 3¼ inches, campanulate, 5-lobed, rose Neyron red 1st shade, style and filaments white, stamens 10 pale brown, stigma red. A well-filled truss, faintly spotted, but of a pleasant colour.

A few days later the IRRORATUM rogue, which had its first flower in 1923, and was then described, flowered for the second time.

It appears to be quite hardy, and the white pink-tinted flower with a threefold blotch of deep crimson at the base is most attractive. A flower sent to Edinburgh, examined by Professor Wright Smith, Mr. Forrest, and Mr. Tagg, was pronounced to be Rh. AGASTUM, or very near it. Then came first flowers on Rh. No. 497 "NERIIARB" (NERIIFLORUM × BLOOD-RED ARBOREUM), 12-14 flowers in a flat-topped truss, 2 × 2¼ inches, 5-lobed, campanulate, clear red—a trifle darker than R. SHILSONII, style and filaments lighter then corolla. Leaves intermediate between the two species. A good hybrid, which flowered at 2½ feet high. On 10th and 11th March we had severe frost, the ponds being partially frozen, and all Rhododendron flowers ruined.

Just before the frost I picked a flower of Rh. No. 358 "CAMPIRR" (CAMPYLOCARPUM × 5851F IRRORATUM forma), which had been frosted before it was well out in 1926. There are 16 flowers to the truss, and the groundwork is cream shading to white, spotted with crimson on the upper lobes, and delicately tinted pink. Not so showy as some, but beautiful in a quiet way.

Fourth week in March a natural hybrid from SCINTILLANS, perhaps with

AUGUSTINII flowered in the seed pan. Flowers in threes, 1×2 inches, very broadly campanulate, almost salver-shaped, pale heliotrope, filaments same colour as corolla, stamens 10 light brown, style and stigma rather more pink. A very delicate shade, and if the plant attains any size it should be very pretty.

Beginning of April Rhododendron near LUKIANGENSE, as identified at Edinburgh, 7 to the truss, 2×2⅔ inches, campanulate, 7-lobed, pale violet-rose, filaments and style a shade lighter than corolla, stamens 14 dark brown, stigma greenish, calyx minute. A poor flower, but the plant was not in good health.

First week in April a plant of RH. No. 226 "CAUKING" (CAUCASICUM var. STRAMINEUM × MRS. KINGSMILL), bloomed for the first time. 10-12 flowers to the truss, 2×2½ inches, broadly campanulate, 5-lobed, cream with crimson spotting on upper lobes, filaments and style same colour as corolla, stamens 10 brown, stigma greenish, calyx minute. A pretty flower of the same colour as the best CAUCASICUM STRAMINEUM × CAMPYLOCARPUM, but the individual bell is larger and more upstanding.

And soon after RH. No. 192 "ARBCAMP" (ARBOREUM ALBUM × CAMPYLOCARPUM), 10 flowers to the truss, 1⅔×2½ inches, campanulate, 5-lobed, creamy-white, with faint shades of pink, crimson spots on the three upper lobes and a blotch of the same at the base, filaments same colour as corolla, style shading pink up to a dark-red stigma, stamens 10 dark brown, calyx minute. A delicate and attractive flower of good substance.

We had some periods of drought this summer, but did not suffer severely, a few recently planted seedlings only being killed.

In October a bush raised from Chinese seed, which I believe to be a natural hybrid NERIIFLORUM × HAEMATODES, about 2½ feet high by 6 feet across, had 21 flowers out, and this after having flowered well in April.

E. J. P. MAGOR.

LAMELLEN, 1928.

## SELECTION FROM THE ERICACEAE.

In some recent contributions to the *Rhododendron Society Notes* the writer has endeavoured to make critical selections from certain series and subseries in the genus Rhododendron, and to suggest suitable situations for their cultivation and general garden arrangement.

On the present occasion it is proposed, in continuation, to deal briefly with the various genera, other than Rhododendron, comprising the *Ericaceae*, and to make a selection of species admirably adapted to association with Rhododendrons generally.

In such a comprehensive category consideration must naturally be given to a wide range of hard-wooded plants, varying in character from the perfectly prostrate to the spacious and tree-like, from dainty and diminutive shrublets to expansive and vigorous bushes.

Their cultural treatment calls for much diversity of arrangement both as regards site, soil, and the degree of sun or shade desirable, and due discrimination is required in determining the type of Rhododendron with which they are to be associated.

In previous articles practical suggestions as to cultivation and grouping have been outlined, and, though their pertinence to the present subject may be noted, repetition is here unnecessary. In cultivation failures are often but the prelude to success ; in grouping individual taste will naturally play a conspicuous part ; in neither can hard-and-fast lines be laid down. Plants are apt to be as perplexing as the people who prescribe for them, and assuredly provide full scope for originality of design and variety of treatment. A governing factor and an unfailing guide to ultimate success will be found, however, in a careful study of the different species to be dealt with, their distinctive characteristics and definite cultural requirements.

Amongst ericaceous plants of widely varying types, practical experiment following upon close observation will be necessary before complete success can be claimed with the choicest species to be found within such genera as *Cassiope*, *Epigaea*, *Rhodothamnus*, *Loiseluria*, and *Phyllothamnus*. These provide a select little coterie of diminutive beauties, as fascinating as fastidious, where the reward of true success is peculiarly well worth winning. They represent, nevertheless, a type of plant which will make its strongest appeal to the specialist prepared to persevere with a difficult subject rather than to the general gardener whose objective covers a wide range, and whose grounds give scope for bold effects. Fortunately such requirements are amply met within the bounds of the *Ericaceae*, and the garden will need to be on generous lines to accommodate to maturity representative groups of the many decorative species here available.

The well-stocked Heath Garden, for instance, provides a singularly attractive horticultural feature at all seasons of the year, and enables us to reproduce within our own grounds much of the floral beauty ound on mountain and moor.

Outside the classic ranks of Rhododendron our group leads into a wide domain distinguished for exceptional beauty of flower and foliage, richness of autumn in leaf-tinting, brilliancy of berry, effectiveness of bark. Here will be found striking examples of hard-wooded plants highly decorative throughout the year, differing widely in habit and character, yet admirably adapted to mutual association, and, with certain specified exceptions, easy of management. Few gardeners would willingly omit *Arbutus* from their trees, exclude *Enkianthus* from the brilliancy of autumn, or remain indifferent to the blue and white fruit of *Gaultheria*, the crimson of *Pernettya*. Such subjects stand as high in their respective spheres as do *Pieris*, *Erica*, and *Kalmia* in the realm of evergreen flowering shrubs, and indeed rank prominently amongst the indispensables of our gardens.

Where a lime-free soil is available the cultural requirements of typical ericaceous plants are by no means difficult to satisfy. In natural habitat they range from exposed hillsides to spongy bogs, and from full sun to dense shade. Many species will be found hardly less happy on stiff clay than on friable loam, though the ideal soil may approximate to a combination of both with a liberal admixture of leaf-mould and peat, while periodical top-dressing with similar material will be found of prime importance to encourage the development of essential surface fibres.

From the following genera a restricted selection of species and varieties has been made likely to prove of general garden interest. The few accompanying notes are merely in the nature of casual remarks in passing by, it being unnecessary to supplement the detailed descriptive particulars so easily obtainable elsewhere.

ARBUTUS—*andrachnoides* (*hybrida*), *Menziesii*, *Unedo* and variety *rubra*; distinguished for flower, foliage, fruit and colour of bark—high qualifications.

ARCTOSTAPHYLOS—*Manzanita*, a good but bare-legged companion to tree Heaths; *Uva-ursi* a dwarf spreader for rough places.

PERNETTYA—*mucronata*, notable for profusion and variety of colour in fruit. Best isolated in beds owing to spread of suckers.

GAULTHERIA—*fragrantissima* (somewhat tender), *nummularioides*, *procumbens*, *pyroloides*, *hispida fructu albo*, *trichophylla*, *Veitchiana*. Remarkable for beauty of colour in fruit, turquoise, bright blue, white and pink. Best grown in peat and shade, particularly *Veitchiana*.

CASSIOPE—*tetragona* (good and easy), *fastigiata* and *Mertensiana* (better, but difficult), choice, diminutive evergreens, bell-flowers, white and pink. Moist, yet well drained, sandy peat, in shade at base of damp, moss-grown rock. Periodic leaf-mould top-dressing.

LEUCOTHOE—*Catesbaei*, *Davisiae*, *racemosa*. Admirable shade-loving species, easy of cultivation, attractive for both flower and foliage.

OXYDENDRUM—*arboreum*, monotypic, tree-like growth, white flowers in racemes, brilliant autumn foliage, partial shade.

EPIGAEA—*repens*, prostrate evergreen, spreading freely in cool, peaty soil surfaced with leaf-mould. Flowers fragrant ; palest pink. Similar conditions will suit *E. asiatica* with blooms of a deeper shade of pink.

ZENOBIA—*speciosa* and *pulverulenta*—the latter generally considered a variety of the former, highly ornamental lily-of-the-valley-like flowers.

ANDROMEDA—*polifolia*, " Bog Rosemary," 1-2 feet, clusters of pink bells in May.

PIERIS—*floribunda*, *formosa*, *Forrestii*, *japonica*, *taiwanensis*, and F 8945. An indispensable group of evergreens distinguished for beauty of flower and brilliantly coloured young growth. *P. taiwanensis* associates admirably with low-growing Rhododendrons. F 8945 is a distinct form of formosa with exceptionally large racemes of flower. *P. Mariana*, a deciduous species, is notable for autumn leaf-colouring. Great plants one and all : grow the lot.

ENKIANTHUS—*campanulatus*, *cernuus rubens*, *japonicus*, and *himalaicus*, profuse pendent blossoms of pink, red, and white, leaves turning to exceptionally brilliant shades of colour in the autumn. Best in rich peat and leaf-mould. Top-dress liberally. No sympathy here for the " starve for leaf-colour " theory.

CALLUNA—*vulgaris*, our common heather, of which the following will be found desirable varieties : *alba*, *Alportii*, *Foxii*, *Hammondii*, *Serlei*.

ERICA—*arborea*, and variety *alpina*, *australis* and its white variety " *Mr. Robert*, "*lusitanica*, *Veitchii* and *mediterranea superba*, form a distinguished group of tall or tree-like growth. Amongst dwarf growers the following may be confidently recommended. *E. carnea* and its hybrids *Vivellii*, *Prince of Wales* and the *Backhouse* varieties, together with *darleyensis*, *vagans* and varieties, *kevernensis*, *Lyonesse*, and *Mrs. Maxwell*, and *cinerea coccinea* and *Rose Queen*. Each one a sun-lover.

BRUCKENTHALIA—*spiculifolia*, low growing, spreading, heath-like, rosy red blooms.

DABOECIA—*polifolia*, Connemara Heath, rosy flowers, freely borne and long-lasting ; the white variety being particularly desirable.

LOISELURIA—*procumbens*. The Alpine Azalea forms a dainty spreading evergreen carpet set with pale pink blossoms, sandy peat and partial shade.

PHYLLODOCE—*empetriformis*, *coerulea*, dwarf, evergreen, heath-like shrubs with rosy or rosy-purple flowers, preferring cool, peaty positions. The writer is very desirous of obtaining the rare *P. nipponica*.

PHYLLOTHAMNUS—*erectus*—a hybrid generally known as *Bryanthus erectus*—dwarf evergreen with drooping rose-pink blooms ; damp, well-drained sandy peat in shaded situation as for *Cassiope*, a difficult subject.

KALMIA—*angustifolia rubra*, *glauca*, *latifolia* ; sturdy evergreens, impervious to frost, ranging from 2 feet in *glauca* to 10 feet in *latifolia*, flowers clear pink to rosy red. Treatment as for Rhododendrons. *K. latifolia* is rarely as well shown as it deserves to be.

RHODOTHAMNUS—*Chamaecistus*, dwarf evergreen, delicate pink blooms. Well adapted to rock crevices with deep root run in full sun. Choice species for limestone moraine.

LEIOPHYLLUM—*buxifolium* and variety *prostratum* (*Ledum Lyonii*), neat, low-growing evergreens, very suitable as edgings to peat beds. Rose red flower buds in great profusion, unfolding petals of palest pink and white.

LEDUM—*latifolium* and *palustre*, hardy low-growing white-flowered shrubs from northern latitudes, adapted to peat bogs, the former much to be preferred.

CLETHRA—*alnifolia*, *paniculata*, *canescens* (*barbinervis*), *tomentosa*, *Delavayi*, deciduous, late-flowering shrubs, with fragrant terminal panicles of blossom, the last mentioned a most attractive autumn bloomer. A " top-hole " plant and a good top note on which to end.

H. ARMYTAGE MOORE.

ROWALLANE, *December*, 1928.

## DECIDUOUS TREES AND SHRUBS FOR THE WOOD GARDEN.

In the last number of the *Notes* I wrote as to the evergreen shrubs and trees other than Rhododendrons, which I have found of most value in a wood garden, and I would now add to that something of what our experience has been here of deciduous trees and shrubs for the same purpose.

They have the advantage of not needing so much shelter in winter as the evergreens do, though many of them owing to the want of sufficient frost in the autumn hold their leaves too long, and when the December gales come get blown over; whilst in gardens more favoured by frost, they lose their leaves in November, and so escape that peril.

The *Prunus* I have written about as before, and so of the *Enkianthus*, but time changes one's valuation of some of them.

It is difficult to write anything about Magnolias, as Mr. Millais' recent work has told us what there is to be said about them, but there is the difference in soil and climate between one place and another, which may produce different results, and I will make my task easier if I confine myself to species in Magnolias and in the other families.

I fear my prejudice in favour of evergreens has made me very hard on the deciduous things, but, if so, those which have been accepted have had a very hard examination to pass. I take Magnolias first, as they seem to me to be the most valuable in either the flowering shrubs or flowering trees.

Of the Magnolias which become trees, two old Kobus here give far more bloom than any other Magnolias so far. They came about twenty-five years ago, very lanky objects in pots, and took some while to recover from that experience, but to-day it would be a moderate estimate to say they have three thousand buds on them, and are about 25 feet high with a good spread. These can be had with very good roots on them from the Yokohama Nursery, and in good land with plenty of room grow at a great pace. I should think they are all seedlings and not grafted.

Wilson's *M. denudata purpurascens* (688 Wilson) is about 30 feet high, and has been flowering for several years, the best seedling from it being now 12 feet high, but I don't feel sure that the seedlings will all give the same beautiful colour as the old plant does, and I am trying to strike cuttings of it, but that is an uphill business without heat.

*Magnolia Sargentii* as a seedling is over 20 feet high, and has been here about as many years, but there is no sign of a bud so far, and it may well be that Chenault's grafted plants of this species will flower as soon, for some of them grow very fast.

*Magnolia officinalis* of Wilson is about 40 feet high, but has been drawn up by big beeches, and so the flowers come rather high to see well, but it is at its best a most lovely foliage plant, and the leaves are larger then *hypoleuca*.

*Magnolia rostrata* has far larger leaves than *M. officinalis*, and I expect from what Mr. Forrest says very fine flowers indeed.

*M. rostrata* and *M. mollicomata* have been confused, but it is quite easy to separate a well-grown plant of each when they are ten yards off with no leaves on them, and far easier when they have the leaves on; the plants I have in my mind are four years old.

Of the shrub class in Magnolia there are here fairly good plants of *parviflora* and of *stellata*. Of the two I prefer the former, but *stellata* at its best runs it very close, yet the growth is slower, and where there is room I would have a group of it.

Of the *M. parvifloras* in this country I believe the larger number of the old plants are very much inclined to sprawl abroad rather than to go up; I speak in particular of the older plants which I believe all came from Coombe Wood, and were all layers from the single plant which was sent to Coombe Wood by Mr. Veitch from Japan about 1879. I believe there are only two importations of *parviflora*, namely the plant just mentioned, and Wilson's seed of 1918 from Korea, which as far as I know it is upright in habit, but otherwise the same as the original Japanese form.

I believe the original Veitch plant is now growing at Sir Robert Harvey's, and those of us who have Coombe Wood plants are probably all of this importation, and many of them are flat in their habit as the result of layering the lower boughs of the old plant.

The plants we many of us had from Chenault were small, very small grafted plants, and they came to us about 1917, amongst them *M. Nicholsoniana*, which is now called *globosa*, which has grown well here and given us some seed. It is perhaps a finer thing than *M. Wilsonii*, and is certainly distinct from it, though both of them are very valuable assets in a garden, whilst they may possibly each of them have, when older, the great virtue of *parviflora*, in giving flower over many weeks, which the evergreen forms *M. grandiflora* and *M. Delavayi* do so generously. I saw blooms on each of these in November last year.

Of the Acers we have tried a good many, and *Acer griseum* gives us the best colour in the autumn, if one plants it out of the wind.

Wilson's Acer (4102) is really my favourite, being so good in its foliage right through the year; he calls it *tetrameron* var. *betulifolium*.

Some of the Palmatum set are very good indeed, but they have long ago lost their labels.

*Acer Henryi* has been spoken very well of, but, as far as I have seen it, there is nothing to be said for it, excepting that it is scarce, and so troubles fewer people.

The *Prunus* are all good when they are doing well, and I am not sure that the double sloe is not the best of all with the double avium nearly as good.

Of the Asiatic forms, *P. incisa* has come on very much in value as one knows

it better, and so has Wilson's *pilosiuscula*. If limited to one species I would have every form *P. subhirtella* which I could get.

In the very worst part of the winter here for flowers, that is from mid-November to mid-February, the *Hamamelis mollis* gives us in a good year nearly a month of flower, and then *H. arborea* gives another three weeks, apart from Rhododendrons, there is then little or nothing else. I think if they are kept to one stem, and get up to be from 12 to 15 feet high, one gets more value from them.

The *Corylopsis* I think a lot of, and the smallest as far as I know, *C. pauciflora*, is very beautiful, but I doubt if *C. goteana* is of any use, though the species called *Willmottiae* or *Veitchiana*, and another like them from Forrest, are all very fine indeed, and can be grown to 20 feet high; which name belongs to which plant I do not think many people can say, if any one can. They are all anxious to make suckers and keep low, but the beautiful drooping flower should be above the level of one's face, to see it well.

I have the following plants, in most cases but one member of each family, but selected because they seemed to be about the best.

*Staphylea holocarpa*, particularly in the pink form, is very valuable in a wood in the spring, and now that it is known you have to crack the seed to insure germination, it should presently be easy to get.

*Clethera Delavayi* is, in the form with black anthers to the flowers, a very beautiful shrub, and will grow 15 to 20 feet high, I should say, but the flowering season is not a long one.

*Tetracentron sinensis* is to me the most beautiful deciduous tree I have seen, though *Nothofagus obliqua* runs it close.

Wilson's *Betula albo sinensis* (4106) is in foliage, and the colour of the bark, the best of that family I have seen, but a form of *Betula utilis* from Edinburgh runs it very close. I find the colour and bloom on the bark varies a good deal with soil and climate in any of the species.

Of *Styrax* there are eight species, and a self-made hybrid here, for the family does for us in May and June what hardly any other does.

The best of them is an old plant of *Styrax Helmsleyanum* from Coombe Wood, it has grown well and has flowered regularly, both flower and foliage being excellent.

The specimen here of *S. obassia* is younger, but in other gardens where it is more developed, it is a most attractive shrub. *Styrax japonica* is, or seems to be, a more robust grower than others, and carries its flowers in a most graceful way if you can get below the bush by coming up hill to it.

The hybrid I speak of is between *Wilsonii* and *langkongense*, the flower being midway between the two, and the growth rapid; some of them flower in the late autumn as well as in June.

So far, the newer forms of *Enkianthus* have not developed sufficiently to tell one much about them, but it is plain that when you can get them out very young in the place where they are to stay, they grow much faster ; and indeed after the Magnolias, they are amongst the most sulky things at being transplanted, unless the young oaks hate it more.

Last year made it plain that of the three trade form of this family *E. campanulatus pallidiflora* is the best form of all, and that *E. cernuus rubens* is very good indeed, with *E. japonicus* wonderful in the autumn, even in Cornwall, but nothing much at other times.

J. C. WILLIAMS.

CAERHAYS CASTLE, 1928.