GEORGE FORREST

JOURNEYS AND PLANT INTRODUCTIONS

Edited by
Dr. J. Macqueen Cowan

Published for
THE ROYAL HORTICULTURAL SOCIETY
by the
OXFORD UNIVERSITY PRESS

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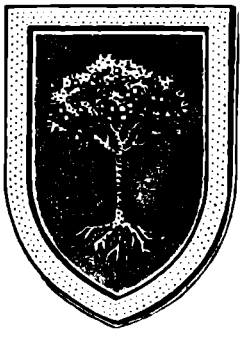
Edited by
DR. J. MACQUEEN COWAN C.B.E.
with the assistance of members of the staff of the Royal Botanic Garden, Edinburgh and E. H. M. Cox



Published for
THE ROYAL HORTICULTURAL SOCIETY
by
GEOFFREY CUMBERLEGE
OXFORD UNIVERSITY PRESS
LONDON NEW YORK TORONTO
1952

Oxford University Press, Amen House, London E.C.4
GLASGOW NEW YORK TORONTO MELBOURNE WELLINGTON
BOMBAY CALCUTTA MADRAS KARACHI CAPE TOWN IBADAN
Geoffrey Cumberlege, Publisher to the University

Published November 1952

PRINTED IN GREAT BRITAIN BY CLARKE AND SHERWELL LTD NORTHAMPTON
AND BOUND BY STAPLES PRINTERS LTD ROCHESTER

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INTRODUCTION

George Forrest was born at Falkirk on the 13th March 1873: he had all but successfully completed his Seventh Expedition to China in search of plants, and had only to finish packing his immense harvest of seed and his cases of herbarium specimens, when he collapsed and died suddenly on the 6th January 1932, while out shooting near Tengyueh.

Forrest, as Sir William Wright Smith observes, was not a ready writer, and it is the ever-enduring regret of those who knew him that he published so few papers. From time to time he wrote privately to patrons and friends describing his journeys and the plants he had discovered, but his letters, though many are extant, furnish material which he alone could effectively have used. His descriptions of plants, more often than not, cannot now be correlated with the plants to which they relate.

That he did not enjoy a period of retirement at home, in which he might have prepared for publication some account of his travels and descriptions of his plants from the many notes he made, is a loss to botanical science as well as to horticulture. It is one which cannot be estimated and for which a memorial volume, such as this, can be no fitting or sufficient substitute.

The three longer papers, which he published, were reprinted by the Scottish Rock Garden Club in 1935, along with a short biographical account and a bibliography of references to his plants. The titles of these papers and the journals in which they were originally published are as follows:—"The Perils of Plant Hunting", Gardeners' Chronicle (May, 1910); "Geographical Exploration with Mr. Litton", Geographical Journal (Sept. 1908) and "Notes on the Plants of North West Yunnan", Journal of The Royal Horticultural Society (1915).

Many of Forrest's friends, and in the forefront among them Lord Aberconway and the members of the Publications Committee of The Royal Horticultural Society, have, for a long time, hoped that some book might be produced to mark his place of eminence in gardening history. Prompted by a similar desire, we at the Royal Botanic Garden, Edinburgh, with which Forrest was closely associated in his later years, had begun, before the war, the preparation of a descriptive list of all the plants he had collected, represented by a herbarium of over 31,000 specimens. Though much of the work had been accomplished by the outbreak of war, many genera had still to be revised and, after the war, with a depleted staff, to have finished the work on the standard originally contemplated was impracticable. A full list

of Forrest's plants, with extracts from his field notes and short commentaries, would run to several volumes. Even if the necessary funds could then have been found, to publish such a work, which would be of value and interest mainly to a limited number of Botanical Institutions, seemed scarcely justified. The material, in manuscript, at the Royal Botanic Garden, Edinburgh, is available to any who wish to consult it.

After discussion with the Publications Committee of The Royal Horticultural Society, it was decided to produce, jointly, a single volume on a more modest scale. It was felt that emphasis should be laid upon Forrest's new species and, within the limitations of funds available, that the more outstanding of his plants should be illustrated. By devoting approximately one page of text to each genus and illustrating one noteworthy species of the genus, a book could be compiled at a reasonable cost; the larger genera—Rhododendron, Primula and Gentiana, for example—would be described more fully, photographs of the more prominent species would be reproduced. Such a book would be of interest to the many who have enjoyed the fruits of Forrest's work and would therefore have a wide appeal.

The appreciation of Forrest and his work in the forefront of this volume was written by Sir William Wright Smith and is reprinted from The Rhododendron Society Notes. Mr. E. H. M. Cox, author of "Plant Hunting in China", kindly agreed to write the chapter on Forrest's travels. The notes on the various genera, which are based mainly upon research work undertaken at the Royal Botanic Garden, Edinburgh, by Sir Isaac Bayley Balfour, Sir William Wright Smith, W. E. Evans, H. F. Tagg, H. Coomber, J. Anthony and others, have all been prepared by members of the Garden Staff—J. M. Cowan (Rhododendron and others), A. Evans, H. R. Fletcher (Primula and others), J. Keenan, L. A. Lauener, M. Y. Orr (Conifers and others) and D. Wilkie (Gentiana and others). It will be observed that certain important genera such as Prunus, Viburnum and Vaccinium, of which Forrest collected a large quantity of material, are not included among the genera described. In these genera Forrest was not responsible for any new and outstanding introduction, although he may have discovered a number of species which are new and others may have been re-introduced by him. Passing reference only has been made to species among the dried plants in his herbarium, which might prove to be noteworthy garden plants, but of which he did not obtain seed or which he did not successfully introduce. A considerable number of such plants belong to genera which are not described.

Some of the photographs are from Forrest's original negatives—others were taken in the Royal Botanic Garden, Edinburgh by R. M. Adam and by R. Eudall. We are also indebted for photographs to Mr. D. Wilkie, Messrs. Downward and Malby, Mr. F. M. Wyatt, Mr. Scase of Wisley, Mr. P. M. Synge, Messrs. Country Life Ltd., and to Miss Blanche Henry for a photograph of Hypericum; and for the loan of blocks from Mr. Cox's book, to Messrs. Collins.

Without the generous help of Mr. P. M. Synge, Editor of The Royal Horticultural Society, not only in the arranging of the text, but in the selection of the photographs, this book would not have been produced. His suggestions have been of the greatest value and he is responsible for the following note on place names.

Considerable difficulty has been experienced in identifying on modern maps many of the places visited by George Forrest. In some cases there have been considerable divergencies in the spelling of the names of the same place in various accounts of this area, while in other cases names have been changed. We are indebted to Mr. M. Aurousseau, Secretary of the Permanent Committee on Geographical names at The Royal Geographical Society and to Dr. J. F. Rock, who has lived many years in Western China, for help and advice in this matter. Where possible the spelling used by Forrest or that on the large scale maps (1 to a million) issued by the Survey of India, 1925–32, Maps 91, 92, 100, 101, or those issued by the War Office, Sheets NH 47 and 48 has been adopted, although in many cases this has diverged from the more phonetic spelling advocated by Dr. Rock. The boundaries of Szechwan have been restricted since the days of Forrest and undoubtedly the larger part of his journeys were made in the area now known as Sikang. Since his field notes refer to Szechwan this name has been retained in most sections of the book, the exception being the chapter on Primula where Dr. Fletcher has preferred to use the more modern name of Sikang.

The following is a short list of modern equivalents of some of the names used.

Atuntze	now	Tehtsin
Batang	now	Paan
Ka-gwr-pu Mts.	probably	Khakarpo Mts.
Li-chiang	now	Likiang
Tengyueh	now	Tengchung
Yunnan-fu	now	Kunming

The map is based upon a map of Forrest's "Botanical Expeditions" prepared from place names on herbarium specimens and drawn and published by the Ordnance Survey in 1934. For assistance in the revision of this map we are indebted to Mr. Holland and Mr. K. C. Jordan of The Royal Geographical Society.

Finally let me add that, although the great majority of Forrest's new introductions have been mentioned and many of his plants have been illustrated, the incompleteness and inadequacy of this work, as an account of Forrest's contribution to Botany and Horticulture, is fully realised. Nevertheless, remembering one who did so much to enrich their gardens, this is a book that the many gardeners, who are keenly interested in the plants they grow, will want to have upon their shelves.

GEORGE FORREST, 1873-1932

"Here he lies where he longed to be;
Home is the sailor, home from sea,
And the hunter home from the hill."—R.L.S.

Fate deals her mortal blow oftentimes at most inopportune and unexpected moments, and George Forrest's death on the eve of his departure for home is yet another instance of such unkind coincidence. The heavy work of the expedition was practically over and there was no mention of ill-health resulting from any of the hardships of travel. Apparently on the 6th January 1932 he had been out shooting some four miles from Tengyueh, and suddenly feeling faint, he had called to his men to come to his assistance. They reached him as he collapsed, and all was over in two minutes. Men of his robust type may end thus from heart-failure. In the old sagas the heroes looked askance at a "straw-death", preferring to fall in the field. Much as we all lament his untimely passing, his end was that of a lover of the wild and of the open. He lies in the graveyard of Tengyueh, side by side with his aforetime comrade Consul Litton, who died after their adventurous journey to the upper parts of the Salween Valley in 1906.

In this brief personal tribute to a great explorer space must be found for a glance at his early life. It is of more than passing interest to know how opportunity fashioned the man and how the man made full use of opportunity. Born at Falkirk on 13th March 1873, he had his education at Kilmarnock Academy in Ayrshire—the usual hard but withal sound training which seems to urge so many of Scotland's sons to seek their fortune abroad. On leaving school his first venture was a post in the shop of a pharmaceutical chemist. This was probably little to his liking, but he stayed long enough to acquire a useful knowledge of medicines and simple surgery, which was of great avail to him in later years when both Chinese and Tibetans sought his aid. Much of his influence with all classes in Western China was due to his generous spirit in giving both time and money to the alleviation of their sufferings. Time and again he had lymph forwarded from Burma at his own expense, and inoculated thousands of the inhabitants of Western Yunnan. When he could be induced to speak of his experiences as medical attendant, his anecdotes were full of self-criticism as

well as of humour. As an embryo-pharmacist at Kilmarnock, he had to devote some time to the study of botany and acquired an acquaintance with his native flora, collecting and drying many of the local plants. After this interlude he made his way to Australia to find what fortune he could. Here he spent several years, chiefly in the open and in the "bush". Then was fashioned the George Forrest we knew, with sturdy frame, deep chest and tough muscles, for he had plenty of hard work with the felling-axe and of hard riding on the sheep-stations. There was, however, but little prospect of advancement and he returned home in 1902, making a short stay in South Africa *en route*. His previous interest in plants induced him to apply to Professor Sir Isaac Bayley Balfour in Edinburgh on the chance that employment could be found for him. Nothing was then available except a meagre post in the Herbarium, which fortunately he accepted—until something better came into view. Indoor work on dried plants was a decided change from life in the Australian bush. But as an antidote he lived six miles out of Edinburgh, tramped both ways each day to the Botanic Garden, and *stood* to his task from nine till five, disdaining the use of chair or stool. Forrest's line of choice never led him to the easy path, and he was ever his own hard taskmaster. But once again chance proved a kindly guide, for his duties involved the scrutiny and arrangement of thousands of specimens from all over the world, and he acquired in these two years a sound acquaintance with the chief families and genera of flowering plants. To this experience also is no doubt due the wonderfully fine quality of his dried material—*O, si sic omnes*. Any ill-effects of an indoor occupation were nullified by his keenness for fishing and shooting, for tramping in hill country and for gardening. His interest in these continued to the end. He was little attracted by games. He may have seen in his time a football or cricket match, but in a long acquaintance, I cannot recall an instance of his attendance at any sporting event where thousands congregate. The best of companions, he had no liking whatever for the town, and was generally restless and unhappy there. In the country he was quite a different man. His friends will always call him to remembrance as the sturdiest of figures, clad in the trim knickerbockers which were his almost invariable wear. Determination was stamped on his somewhat grim features, and he might well have borne the badge *Nemo me impune lacessit*. It was but rarely he offended his own feelings and those of his friends by garbing himself when occasion demanded in the clothes deemed to befit a townsman, and never was he seen in plus-fours. The ineffaceable impression he left on all who met him was that of a man who knew exactly what he wanted to do and was certainly going to do it.

To the man of thirty-one thus fashioned and equipped came his opportunity in 1904. Mr. A. K. Bulley of Neston, Cheshire, keenly interested in alpine plants, applied to Sir Isaac Bayley Balfour for some one who was qualified to undertake botanical exploration in Western China, and Forrest entered a field which he was never to forsake. The richness of the flora of

the provinces of Western China was long unsuspected. The botanical collections of Professor Augustine Henry were evidence enough for the less westerly areas; the material obtained by the French missionaries such as David, Soulié, and Delavay in Szechwan and Yunnan provided an abundant supply of new and interesting species for elaboration by Franchet and his co-workers in Paris; Wilson had already begun his journeys which were to result ultimately in the publication of *Plantae Wilsonianae*. But most of the evidence concerned only dried material in various herbaria, and the whole of the territory was almost virgin ground for the horticultural explorer. The results of exploration work at various hands during the last thirty years have shown that the area embracing Yunnan and Szechwan contains possibly the finest alpine flora in the world. Forrest was thus most fortunate in his lot. He began with Yunnan, and in all his eight expeditions Yunnan was ever the centre. He made incursions into alpine Burma, S.E. Tibet and S.W. Szechwan, but he never believed even at the end that he had secured all the floral treasures of his favourite province.

On his advent in 1904 Yunnan was no peaceful country. From 1904 to 1906 he had as much in the way of perilous adventure as a man of his type could desire. The Chinese were having one of their periodical disputes with the Tibetans, and the latter did not discriminate between Chinese and other foreigners and were massacring Chinese and French missionaries with equal zest. Forrest was at Tseku as a guest of Père Dubernard, a veteran of the French Mission. A party of eighty (including Forrest and his seventeen collectors and servants) had hurriedly to evacuate Tseku and flee. Overtaken by the pursuing Tibetans, all were killed except a bare dozen. Père Dubernard was brutally tortured to death and a fellow priest killed on the spot. Of Forrest's personal following only one survived. Forrest had the good fortune to escape after a pursuit of some ten days without shelter and practically without food.

To this first expedition belongs also his venturesome tour with Litton into the Upper Salween Valley among tribes who owed allegiance neither to China nor to Tibet. Two German explorers who repeated the journey a little later were killed by the same tribesmen. The subsequent expeditions of Forrest were not fraught with the same risks, as the country was relatively quiet—it was never quite free from disturbance. But Forrest's personality contributed to good relations. He was soon on friendly terms with the Chinese, with the Tibetans, and with the tribesmen of many names. He took great interest in their life and manners, doctored them by his own methods, and helped them in many ways.

One cannot venture here on any account of his various journeys, but it is needful to give a survey of the general results. His collections from Yunnan in the way of botanical specimens number over 30,000, and form the most important contribution to the flora of that province ever likely to be made. On his earlier expeditions his choice was very general, but on other occasions he devoted special attention to trees and shrubs and especially Rhododendron,

while Primula was never forgotten. Gleaners in his field will not find much in the way of flowering plants which he failed to notice, except it be in those families such as grasses and sedges where the flowers are inconspicuous or where they are natives of the warmer regions below 5,000 ft. Apart from mere numbers the material is of the very highest standard, and each gathering is accompanied usually by very complete notes. The copiousness and choice of the material are as remarkable as the beautiful way in which it is dried. I must here cite the opinion of a Japanese botanist, Professor Kudo, who published recently, after fifteen years' study, a monograph on the Labiatae of Eastern Asia. He visited over forty of the chief herbaria in Europe, Asia, and America, and states in his book that Forrest's specimens of Chinese plants are "die beste in der Welt".

It is of special interest to the members of this Society to know that for quantity and quality his Rhododendron collection is unique, and is easily the finest extant. Forrest was very devoted to this genus, and was ever hoping to find the "centre of the Rhododendron world". Whether there is such a place I gravely doubt—unless it is defined broadly as Western Yunnan. But Forrest's contribution to the genus is as his memorial, something "more lasting than bronze". Primula probably came next in his affections, and he made many notable additions to the known species.

I have already referred to some of the reasons which made Forrest so successful an explorer, but there are still some of his characteristics well worth recording. He shared very markedly in the attributes of the *naturalist* of the days before this era of specialisation. His collections of mammals, birds, and insects have been overshadowed by his botanical finds, but they were noteworthy in their way, and he was much interested in securing them. He was full of information regarding the various peoples he came in contact with—their manners, customs and pursuits. He knew much of the geological formations and minerals of the provinces, and his notes on plants generally included reference to the character of the soil. Long before it was admitted, he knew that many Rhododendrons would grow on limestone.

He was singularly successful in the training of the native collector. These hillmen became remarkably adept and served the useful purpose of covering more ground than even his energetic self could hope to do. They were most loyal assistants. A cable from Forrest was enough to set them going, and on his arrival at Bhamo he was welcomed by men who had in some cases journeyed six weeks to meet him. His seed-collections consequently were on a generous scale. He was even reproached sometimes for too catholic a taste in his choice of plants. It is easy to prophesy after the event, and no easy matter for a collector in the wild to interpret horticultural value. There are many Gentians in Yunnan which rival *G. sino-ornata*, but will they adapt themselves to our climate? There are many Primulas there transcending *P. malacoides*, but not one of them is likely to receive a similar welcome and attention from horticulturists throughout the world. There are glorious alpines on the cliffs of Yunnan such as Isopyrum, Solms-Laubachia, and

Lithospermum, but have they been successfully introduced? Forrest went on the principle of securing all he could and so tried to satisfy both horticulturist and botanist. Members of the Rhododendron Society may be assured that from the scientific point of view the mass of material at different stages obtained by Forrest has proved of the utmost value in interpreting the many problems of their favourite genus.

Forrest had good powers of organisation, and his explorations were carried out very methodically. He acquired a fair facility with that most difficult language, Chinese, and some acquaintance with hill-dialects. An enthusiastic photographer he was the possessor of some thousands of illustrations of the country, its peoples and its plants. His photographic records of alpines show conclusively that, much as he relied on his men for the detailed collecting, he never spared himself his full share of hard work on the highest cliffs and screes. Among the noteworthy Forrestian plants I can recall only one or two which he himself had not seen *in situ*.

He was well acquainted, as he had to be, with the written records of the discoveries of his predecessors, and was a persistent searcher after their more important and often elusive finds. One such, *Primula glacialis* from the Li-chiang cost him long and almost vain pursuit—the book-description was all he had to go by—and years after it was clear that he had secured it without its identity being realised at the time. The notes attached to his specimens are indicative at all times of keen observation, sound knowledge of the systematic position of each plant, and withal an eye for beauty.

It is a thousand pities that he could never be induced to write an account of his travels. The story of these last twenty-seven years would have been a fascinating one. Often spoken of, it was always postponed till his days of retirement—days which never arrived. The task did not appeal to him, and yet in his letters it was evident enough that he had the gift of narration. In many ways he was reserved and not a talker except in the company of his personal friends, and then he always held his own. Diffident of his powers of speech, he was not often persuaded to give a lecture. In his earlier attempts he was, in the parlance of the Scottish Church, a "reader", but in his later years he spoke with freedom and delighted large audiences, illustrating his story with numerous lantern slides taken from his own excellent photographs.

There was no mistaking the fine quality of the man and the evidence of power. He was in many ways a "bonny fechter". Sternly self-disciplined and eminently a man of his word, he was ever scrupulously anxious to do his best for those in whose interest he undertook his explorations. It is pleasing to recall that in one of his last letters home he expressed himself satisfied with the spoils of 1931. *Ipsissima verba:*—"I may with safety say that this will be the best year I have yet had. If all goes well, I shall have made a rather glorious and satisfactory finish to all my past years of labour." A true prophecy . . . but how gladly would his many friends have stayed the hands of fate, were it only for a little longer. *Ave et vale.*

"They told me, Heracleitus, they told me you were dead;
They brought me bitter news to hear and bitter tears to shed.
I wept, as I remembered, how often you and I
Had tired the sun with talking and sent him down the sky.
And now that thou art lying, my dear old Carian guest,
A handful of grey ashes, long, long ago at rest,
Still are thy pleasant voices, thy nightingales, awake,
For Death, he taketh all away, but them he cannot take."

(From the Greek of Callimachus. Trans. W. Cory.)

EDINBURGH, 1932. W. WRIGHT SMITH

(Reprinted from The Rhododendron Society Notes, Volume 3, No. 5, page 271)

THE JOURNEYS

Plant collecting is as the plant collector wishes to make it; a part-time hobby, a one-man job, a specialist search for a particular plant or group of plants, or, as George Forrest made it, an all-embracing life's work.

There have been many instances where plant collecting has been a by-product of general exploration, during which the collection of a fine new plant has largely been a matter of luck, of being at a given place at exactly the right time. There have been collectors, like Kingdon Ward and Farrer, who have followed a lone hand and have been responsible for every specimen and every seed. There have been collectors who have done their job on factory lines, whether from inclination or from force of circumstances. Of these George Forrest was the extreme example.

Let us state at the start that Forrest chose the hard way. The lone hand can suit himself. He can choose his own route, take his own time, collect when it pleases him and rest when it pleases him. Forrest was his own planner, chief executive, works manager, foreman and office staff as well as collector. It often meant working eighteen hours a day under conditions that were far from pleasant.

N.W. Yunnan and S.E. Tibet, where most of Forrest's collecting was done, contain one of the largest accumulations of ornamental plants in the world. These areas are also among the most peculiar in their geographical features. Through them, running more or less from north to south, flow four of the great rivers of Eastern Asia, the Nmai Hka (the eastern branch of the Irrawaddy), the Salween, the Mekong and the Yangtze. In between 27° and 28° north these four rivers are squeezed into an area barely a hundred miles wide. Considering the high ranges that form the watersheds and the deep valleys through which the rivers flow, it is not surprising that communications are difficult. Even more peculiar is the fact that in many cases the upper valleys, above 12,000 ft., are comparatively undulating and easy of access once sufficient altitude has been reached, while the lower valleys are gorges with precipitous sides. Thus plant collecting in these upper valleys may be fairly straightforward, but it may take several days to get from one watershed to the next, although it may look little more than a stone's throw away.

Forrest's main collections were made in an area of approximately fifty thousand square miles. Rich though this area as a whole may be, there are

large sections of country where the plant population dwindles, as for instance in the dry Mekong Valley where conditions encourage only xerophytic plants. Much of the Yangtze Gorge round the famous bend is similar country, while north of the bend the flora of much of the Chungtien Plateau is uninteresting, largely because of the everlasting wind. As a general rule western exposures have a richer flora than eastern, as they are more under the influence of the south-west monsoon with its heavy rainfall. The river valleys and this influence of the monsoon tend to contract first class collecting areas. Many gardeners, who have heard vaguely of the glories of the plant life of Western China, imagine that Rhododendron forests and alpine meadows stretch on and on beyond the horizon. That is very far from being the case. Where the flora is rich owing to suitable climatic conditions, it is quite outstanding in quantity and quality, but these areas may be separated by large stretches of country that hold a very poor flora.

In his very first expedition in 1905 Forrest chose the line of bulk collecting. Throughout his many years in Yunnan he was always able to recruit a suitable labour force and keep it under his control. The mountains and valleys of N.W. Yunnan, Upper Burma and S.E. Tibet for centuries have been a kind of no-man's land, a last refuge of tribes who have been driven out of more fertile areas by stronger neighbours. The consequence is an extraordinary hodge-podge of small communities, each one differing from the next in speech and often in habit. That Forrest had so little trouble with his native collectors goes a long way to prove the very great respect in which he was held throughout these hills.

It was the geographical features that partly forced him to collect through groups of native collectors. If he were to have worked single-handed, difficulties of communications would have made him examine thoroughly each season a small area of perhaps four or five hundred square miles at the most. But the terms of reference in his agreements precluded this form of plant exploration. The particular paragraph referring to this aspect of one expedition reads as follows:

"Mr Forrest will as soon as practicable make and conduct to Bhamo in Upper Burma and thence to the regions or districts next hereinafter mentioned an expedition for the purpose of collecting bulbs seeds and plants of horticultural value and also botanical specimens of plants in the regions or districts situate in the western and north-western parts of the Province of Yunnan the western parts of the Province of Szechwan (in China) and the south-eastern parts of Tibet (or such of the said regions or districts as may for the time being be accessible) and for the other purposes hereinafter mentioned."

Even with the complete absence of punctuation in this legal verbiage it is clear that the syndicate for whom he collected expected him to cover as large an area as possible, a task that was quite impossible without a large staff of native collectors. This point has had to be stressed, as one of the

criticisms most often laid against the bulk collector, if he can be called such, is that for most of the collecting period he remained at his temporary H.Q. and had little time for personal collecting. Forrest seemed to find time for everything, but in doing so he worked himself to the bone, and usually by the end of the season he was completely worn out.

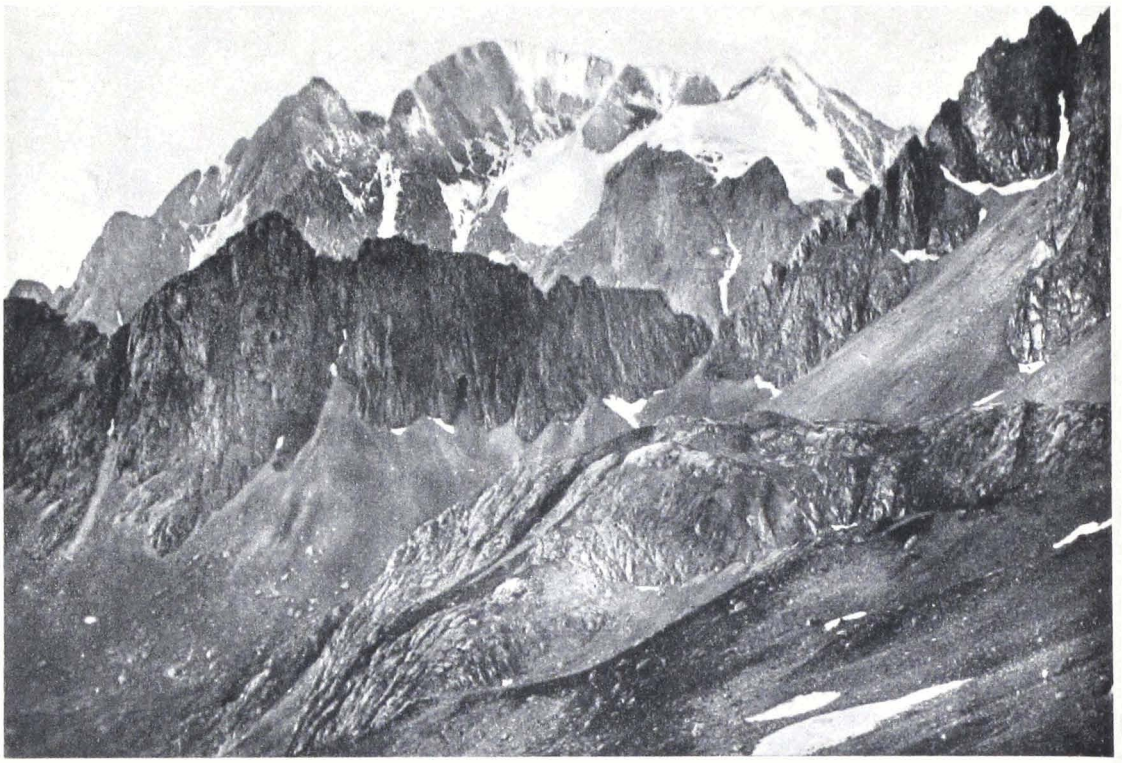
One of the most interesting questions, which unfortunately may never be cleared up, is what method he used in picking at the start, and then training, his native collectors. Even during his first expedition in 1905 he wrote about "a number of well-trained and faithful Lissoo followers". As this was in the area under the influence of Roman Catholic missionaries at Atuntze, on this occasion he may have borrowed men already partially trained. But later he chose the villagers of U-lu-kaey, a tiny hamlet at the foot of the great Li-chiang Range, as the source of almost all his native collectors, a hamlet so remote that no one there could have had any experience of plant collecting. Forrest must have had an infinite capacity for taking pains, as in a very short time the men were well trained and capable of travelling long distances on their own to collect specimens and seed of special plants. That they were often successful is abundantly proved from the records.

It is not easy to produce a readable account of all Forrest's journeys. Although he was a voluminous letter writer, his letters were either very personal to his family or very businesslike to J. C. Williams or other gardening friends. In the middle of the collecting season he had little time to write about anything other than his job, which took up his time to the exclusion of almost everything else.

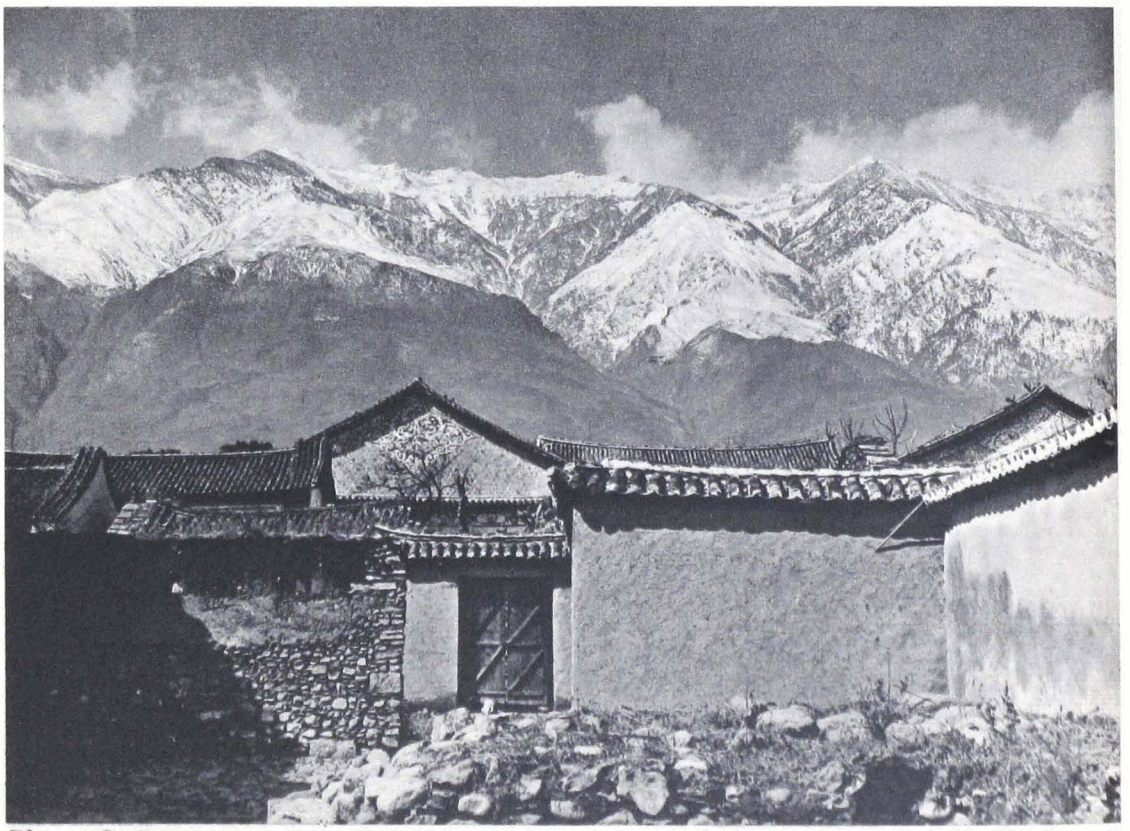
The amount of material on which to base an actual account of all his journeys is sketchy. In addition, as he or his men often covered the same ground on several different occasions, a detailed account of all his tours would tend to become a tiresome repetition of Chinese names. Luckily, however, a very full correspondence exists of his third expedition which was also one of his most important and successful. It has been thought better, therefore, to concentrate on these years, 1912 to 1915. These will give a better idea of how he managed his collecting and of the ground that was covered than would more shadowy outlines of all his expeditions.

Forrest was thirty-one when he first went to Yunnan to collect plants for that great character, A. K. Bulley, who was later to influence Reginald Farrer to collect in Kansu in N.W. China. During the years 1904 to 1906 Forrest covered a great deal of ground, collecting many specimens but little seed.

He started too late in the year and did not reach Tali until August 1904. From there he made a quick reconnaissance to the Li-chiang Range, up the Yangtze Valley and crossed over to the river Mekong by the Kari Pass, about 28° 10′. He came back in the middle of winter across the Chungtien Plateau down to Tali, a fierce journey over one of the most windswept areas in Yunnan.



South-west face of the Li-chiang peak



Photos, G. Forrest

Tali Range, looking north-west from the city

In 1905 he retraced his steps to the Mekong. It was at Tseku on the Mekong that he was attacked by Tibetans and barely escaped with his life.

"In the summer of 1905 I found myself collecting in these mountains, my headquarters being with the hospitable and venerable chief of the Tseku mission, Père Dubernard. . . . The region was unsettled, the Lama world around had been disturbed by the invasion of Lhasa in 1904 by Colonel Younghusband's expedition, and still more rudely shocked by the attempt of the Chinese to establish themselves at Batang, a small town on the great road from Szechwan to Lhasa. These circumstances led to a rebellion of the Batang Lamas, and the murder, with all his followers, of a high Chinese official at Batang in March of that year. At the same time the French missionaries stationed there, with all their converts, were killed, and the mission stations destroyed.

The trouble was not long in spreading south to Atuntze, a small Chinese-Tibetan trading station, situated on a terrace high above the left or east bank of the Mekong, and only two and a half days' journey from Tseku, which nestled under the cliffs close to the right bank of the Mekong, in latitude 28° north. Chinese officials and troops were sent to Atuntze in April to restore order, but it is needless to add they only made confusion worse confounded, and in a few days they were completely hemmed in. Rumours and counter-rumours poured into the mission at Tseku day by day, adding to the difficulty of our situation, and the terror of the native Christians. It soon became clear that the Lamas meant business and were determined to pay off old scores of jealousy against the missionaries, who had endeavoured for so many years, not without success, to deliver the people from the moral and material chains of Lamaism.

Even our friends among the Tibetans fell away from us or proved false. The mission house was indefensible, and, if defensible, we had no one to defend it save two aged French priests and myself. Therefore, when on the evening of July 19 the news came that the town of Atuntze had fallen, that the Chinese troops had been wiped out almost to a man, and that the Lamaseries were all up and concentrating their forces to attack Tseku, immediate flight became necessary.

The rising moon that night saw us making our way by a narrow and dangerous track along the right bank of the Mekong, the two Fathers on their mules and myself and the little band of native Christians on foot; on our left roared the Mekong in furious flood, on our right rose the great Mekong-Salween dividing range. We hoped to reach the village of Yetche, 30 miles to the south on the left bank of the river, where there was a friendly chief and some Chinese troops; but, unfortunately, as in the dark we passed the Lamaserie of Patong, owing to a noise made by some of our party, we were detected, and a shrill signal whistle was sent across the river to warn the countryside of our escape. Early next morning, at the next village, we were told that the enemy, by executing a forced march, had crossed the river to the south, and had raised the people therein thus cutting off our

retreat. The local headman, a drunken and treacherous rascal, found many excuses to delay our flight, and thus we lost more valuable time. Eventually we got away from him, and proceeding early in the forenoon we reached a height to the south of the village. From this point we had a clear and extensive view looking to the north, and saw a great column of smoke rising in the still morning air over the site of Tseku. Then our last hope of escape left us and we knew the enemy was hot on our track. . . . To the north I had a clear view of the crest of the ridge we had descended, and had not long to wait ere my expectations were realised. Suddenly there appeared a large number of armed men running at full speed in Indian file along the path we had just traversed. I gave the alarm at once and immediately all was confusion, our followers scattering in every direction. Père Bourdonnec became completely panic-stricken, made his way across the stream by a fallen tree, and, despite my efforts to stop him, rushed blindly through the dense forest which clothed the southern face of the valley. However, escape in that direction I was sure would be impossible, as our delay had given the enemy time to mature their plans and close in on us; the Père had not covered a couple of hundred yards ere he was riddled with poisoned arrows and fell, the Tibetans immediately rushing in and finishing him off with their huge double-handed swords. Our little band, numbering about 80, were picked off one by one, or captured, only 14 escaping. Of my own 17 collectors and servants only one escaped.

The valley in which we were surrounded was a rift in the hills some four miles long by one and a half broad, closed to the east by the Mekong, and to the west by the dividing range, while to the north and south were high ridges occupied by the enemy, and thickly clothed with pine and mixed forests. When I saw all was lost I fled east down a breakneck path, in places formed along the faces of beetling cliffs by rude brackets of wood and slippery logs. On I went down towards the main river, only to find myself, at one of the sharpest turns, confronted by a band of hostile and well-armed Tibetans, who had been stationed there to block the passage. They at once gave chase. For a fraction of time I hesitated; being armed with a Winchester repeating rifle, twelve shots, a heavy revolver and two belts of cartridges, I could easily have made a stand, but I feared being unable to clear a passage before those whom I knew to be behind me arrived on the scene. Therefore I turned back, and after a desperate run, succeeded in covering my tracks by leaping off the path whenever I rounded the corner. I fell into dense jungle, through which I rolled down a steep slope for a distance of two hundred feet before stopping, tearing my clothes to ribbons, and bruising myself most horribly in the process. I then got behind a convenient boulder and made every preparation for a stand should they succeed in discovering my ruse, which I never doubted but they would. Fortunately, however, they did not find me, and, presuming I had continued my course up the valley, rushed past my hiding place. There I lay till night fell, when I attempted to escape south, but after toiling up 3,000 ft. of rock and through

forest and jungle, I found a cordon of Lamas with watch-fires and Tibetan mastiffs, which precluded all hopes of escape in that direction. As daylight approached I had to return to my hiding place by the stream. The following eight days and nights were hopeless repetitions of the first; the days were spent in hiding in the most convenient spot I could find at dawn, the nights in trying to elude the watchfulness of my enemies and get away south.

For that time all the food I had consisted of two dozen ears of wheat and a handful of parched peas, which I providentially found where they had been dropped by a fugitive or some of the Lamas. On the second day I was forced to discard my boots to avoid leaving distinctive trails, burying them in the bed of the stream. Another day I had to wade waist deep for a full mile upstream to evade a party who were close on my heels. Once a few of them came on me suddenly and I was shot at, two of the poisoned arrows passing through my hat. Another time my hiding place was discovered by a Tibetan woman, one of many who had been sent out to track me down. Once as I lay asleep under a log in the bed of the stream I was awakened by the sound of voices, and a party of thirty Lamas in full war paint crossed the stream a few yards above me.

At the end of eight days I had ceased to care whether I lived or died; my feet swollen out of all shape, my hands and face torn with thorns, and my whole person caked with mire. I knew the end was near and determined to make one more bid for life. In the valley there happened to be two small villages of four to six huts in each, peopled by Lissus, a sub-tribe of Tibetans. I decided on holding up one of these to force the inhabitants to give me food. This plan I carried out on the evening of the ninth day. Fortunately, instead of opposing me, the people proved friendly. Their one and only food consists of parched barley, or wheat coarsely ground; it is called "tsamba". This they offered me, and having little self-control after such a long starve, I ate it ravenously, in fact to such an extent that I almost died of the effects.

The headman of the village proved one of the best friends I ever had, and at once commenced making arrangements to smuggle me out of the country. After four days spent in restful hiding, we descended the valley until we reached its junction with the Mekong. Here we were met by the headman of a village situated there. He informed us that though the majority of the rebels had returned north, there were still many bands scouring the countryside in search of me; in fact, one had spent the previous night in his village. He suggested we should go into hiding until after sunset, when he would send out some of the native hunters to escort us to a farmhouse a few miles distant where we could spend the night in peace. Then on the following day with guides he would send me. I was to ascend westwards almost to the summit of the dividing range, and then striking south we should skirt the troubled region and thus reach safety.

This plan we eventually carried out, but the misery of it all is beyond my powers of description. It was the middle of the rainy season, and I soon found myself in the thick of the worst downpour Yunnan had known for a

generation. Up and up we climbed, struggling through cane-brakes, cutting our way through miles of Rhododendrons, tramping over alps literally clothed with Primulas, Gentians, Saxifrages, Lilies, etc., till we reached the snowfields on the backbone of the range, at an elevation of from 17,000 to 18,000 ft. We had no covering at night; no food but a few mouthfuls of parched barley, and the rain and sleet fell in such deluges that to light a fire was impossible. On reaching the summit we turned south, travelling in that direction for six days, over glaciers, snow and ice, and tip-tilted, jagged, limestone strata, which tore my feet to ribbons. On reaching this point we hoped we had got beyond the danger zone, and commenced our descent eastwards towards the Mekong. Down, down we went over sharp jagged rocks and through Bamboo brakes, until we reached the inhabited zone at about 9,000 ft. Here, to put the finishing touch to my misery, I seriously hurt one of my feet. Round most of the villages the inhabitants are in the habit of placing in the paths around their maize fields what they name "panji". These are sharpened and fire-hardened pieces of Bamboo of 12 to 18 ins. in length. They are buried in the ground fully three-quarters of their length, the sharpened end upwards, and covered loosely with soil or leaves. In approaching one of the villages by an exceptionally muddy path, I unfortunately stepped on one of these "panji". The spike, fully an inch in breadth, passed between the bones of my foot and protruded a couple of inches from the upper surface. I suffered excruciating agony for many days, and it was months before the wound healed completely.

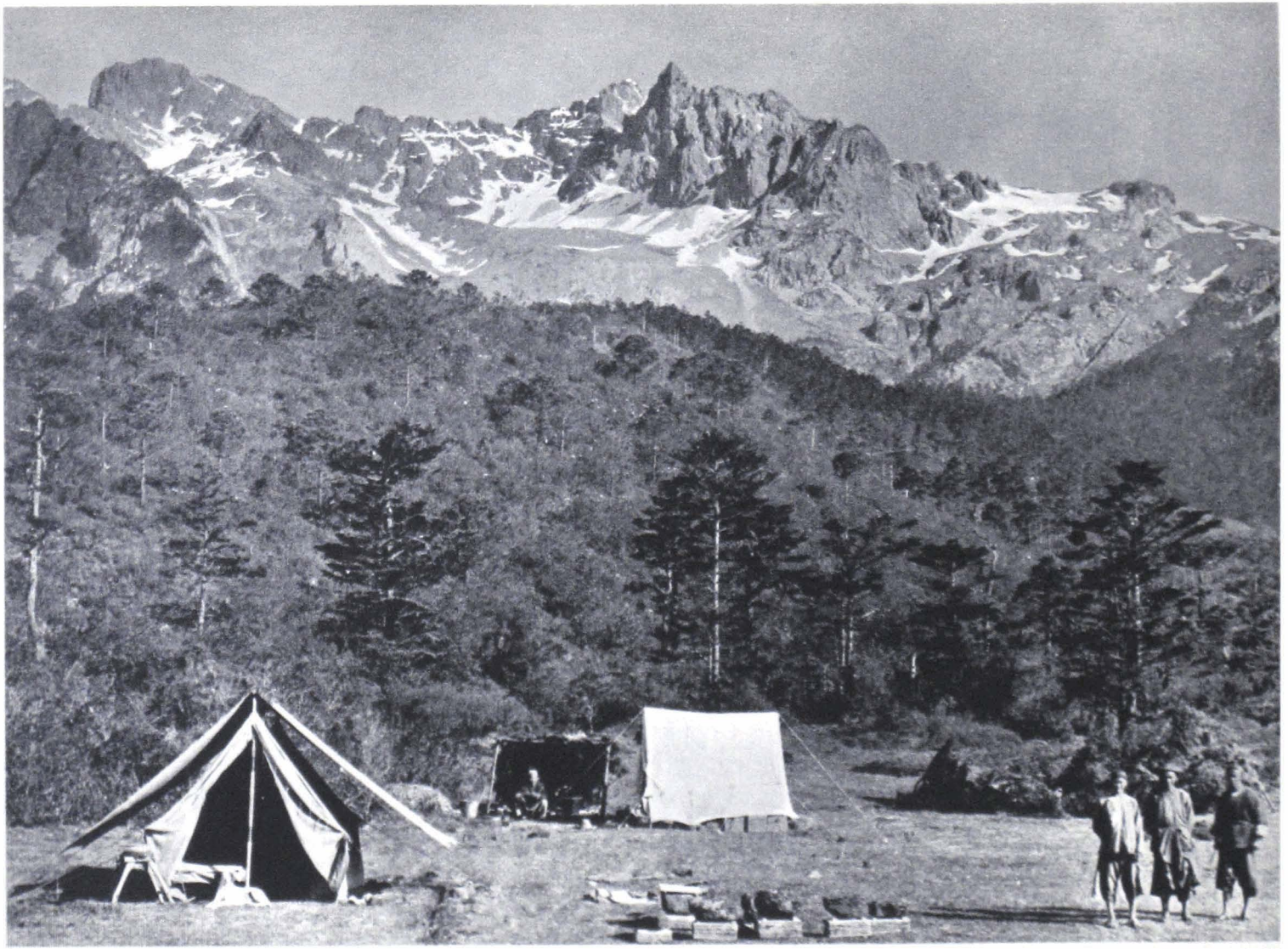
Finally we arrived on the right bank of the Mekong opposite the large village of Yetche, whose chief was a friend of mine. My troubles were almost over. This excellent man came across the river at great risk to himself, bringing clean cotton clothes for me, besides a large quantity of food, such as pork, eggs, chicken and cakes. At last I got what I required even more than those, a change of clothing, a good wash and a night's rest.

As bands of Lamas were still prowling about near Yetche, disguised as a Tibetan and accompanied by my faithful guides, I continued my course down the right bank of the river, till four days later I arrived opposite the little Chinese-Tibetan township of Hsiaoweisi, where Chinese troops were stationed. On reaching the town I found another missionary, Père Monbeig, who had also escaped from a station in the west. He and the Chinese officials welcomed me as one returned from the dead. A few days later he and I accompanied by an armed escort commenced our journey south to the nearest city, Tali, which we reached in safety in 19 days.

Although escaping with my life, I lost everything I possessed, all my camp equipment, ammunition and guns, cameras, stores. In fact, my all with the exception of the rags I stood in, my rifle, revolver and two belts of cartridges."

As if he had not had enough, Forrest returned to Tengyueh and started off again on Oct. 11th 1905 with the British Consul, G. L. Litton, up the Salween Valley. This was pure exploration, as up to that time no white man

George Forrest's Camp in the Li-chiang Range



Photo, G. Forrest

had travelled far up the valley; and, of course, it was not the time of year for plant collecting. Unfortunately Litton fell ill in that unhealthy valley and died shortly after their return to Tengyueh from blackwater fever. Forrest wrote an account of this trip for the *Geographical Journal*, more than usually interesting, as it shows what an acute observer he was of his fellow human beings, when he could spare the time away from his plants. But most interesting of all are his descriptions of the country. He and Litton left the Salween Valley and climbed a pass on the Salween-Mekong Divide:

"This part of the upper Mekong differs widely from the Salween Valley in the same latitude. Instead of sharp crags and cliffs of limestone, dense semi-tropical jungles, extensive forests, and wild Lissus with their poisoned arrows, we viewed a peaceful scene of wide, bare, cultivated slopes of clay or disintegrated sandstone, shelving down in terraces to the river below. The basin of the Mekong at this point is twice the breadth of the Salween though the altitude of the latter river is a thousand feet less. The people, like the scenery, are altogether less wild than on the Salween.

We ascended a spur, through oak scrub and over grassy slopes, rising in the day's march from 7,400 ft. to 10,500 ft. on the slope towards the Salween divide. At this altitude there was a superb view of all the great ranges of N.W. Yunnan east of the Mekong, from Tali-fu to the borders of Tibet. Most of these panoramas are dominated by the glittering snow-mountain of Li-chiang; and from the altitude we had reached Mr. Litton saw for the first time the peak which I described to him after my return from my journey down the Chungtien Plateau. He estimated the height as being very near to what I put it down as, 22,000 ft.

After an intensely cold night on the mountain-side at 10,500 ft. we proceeded on November 19th up the pass, which for the first time was traversed by European feet. The path after topping a spur lay through pine woods deep in snow, and then over a frozen black marsh surrounded by tall sombre firs, whose dark green foliage stood out against the snowy slopes of the pass and the deep blue sky above. Then an ascent through Rhododendron scrub, and over a bare down, where we passed a number of wild Lissu going down to the Mekong to barter for salt, brought us to the summit of the pass at 12,300 ft.

Here a surprise awaited us, for the view to the west was perfectly clear, and the whole of the great Salween-Irrawaddy Divide was spread out before us. From a little below the pass this range could be followed to the north as far as the eye could reach, until at a distance of about a hundred miles from where we stood, and in approximate latitude 28° 30′ N. it was merged in a huge range of dazzling snow-peaks, trending westwards. This range is doubtless the east source of the Irrawaddy and forms the divide between it and the Zayal, the Brahmaputra system.

The upper slopes of the Salween-Irrawaddy Divide which we saw spread out before us resemble a vast wall. The trend of the range is most regular

from north to south, and there are no very conspicuous peaks. The average height of the summits in this latitude, 26° 55′ N., would be probably 12,500 to 13,000 ft. There was practically no snow on it in November.

Below the wall-like ridge which forms the backbone of the range, limestone spurs, crags and precipices in bewildering confusion fall down to the Salween. It was easy to see why the upper slopes of the range are uninhabited, and why this mountain barrier is an ethnographical boundary between the Lissu and the Kachin races."

This gives an almost perfect word picture of the great ranges and rivers of N.W. Yunnan. They were lucky to have seen such a large area so clearly, even at the beginning of winter.

What he had seen in 1905 of the Li-chiang Range proved so inviting that in March 1906 he started off for Li-chiang-fu and made his headquarters for the season two days north of the town on the eastern flank of the huge snow range. He was able to spend a month or two in searching the southern portion of the eastern flank before his health gave way as a result of the feverish conditions of the Salween trip of the year before. He became seriously ill and was lucky to get back to Tali-fu and the skill of Dr. Clark of the China Inland Mission. It says a great deal for the mutual trust already instilled between Forrest and his native collectors in such a short period that his collections continued to grow while he was on his sick-bed:

"For some days previously I had received warnings from my symptoms of what to expect, and had accordingly made arrangements in the event of sudden illness for my best men to continue the work and secure the season's harvest. I may mention that my expectations of them were more than realised. They worked excellently, only a few plants marked down being lost, and I had much reason to be grateful to them. A constant service of runners was bringing in spoil from my northern base nine days from Tali, and eventually I had the satisfaction of closing the season and the first three years' expedition most successfully."

In 1910 he returned to his base on the Li-chiang Range. This was the expedition on which, more than any other, he confined his energies to exploring this magnificent hunting ground, particularly the northern half of the east flank and part of the west side. He returned home in 1911.

Forrest's third expedition, from February 1912 to March 1915, is almost the only one which can be worked out in detail. This is largely owing to the existence of a full and detailed series of letters from Forrest to John Charles Williams of Caerhays Castle in Cornwall, who financed almost the whole of these three years of intensive exploration. It is from these letters that we can learn how he utilised his man-power, fought with the weather a continuous and often losing battle, overcame the enormous distances that had to be covered on foot and juggled with the short flowering period and seed harvest so as to make the greatest use of his opportunities.

Actually at the start he was more than a little doubtful about the pos-

sibility of getting to his hunting grounds at all. China as a whole was in a state of chaos, and it was almost impossible to find out at home what exactly were the conditions in Yunnan. As a result Forrest chose Tengyueh, the nearest town to the Burma frontier of any importance, as his immediate base with a view to collecting on the Nmai Hka-Salween and Salween-Shweli Divides, both within moderately easy reach of Tengyueh and both with a more semi-tropical and rain-forest type of vegetation than he had previously collected.

On his arrival at Tengyueh in the middle of May he found conditions almost as bad as elsewhere in the country. He wrote: "Since before October of last year the city has been in the hands of the revolutionary troops, a band of undisciplined ruffians purely and simply out for loot, and commanded, or led I should say, by two blackguards the principal of whom, Li-kin-yen by name, is shortly, I understand, to fill the place of Viceroy of the province. You will understand what all this may mean to us later when I tell you that this chap, previously to the revolution, was a common coolie. On the breaking out of the revolution the general then in command of the troops, with many of his officers, was brutally murdered at the instigation of this creature who then took command and turned the place into a perfect shambles. Squeezing and beheading was the order of the day, and is still, though in a lesser degree. In all fully 250 have been beheaded, not so bad out of a population of 5,000 to 6,000, and all of them without the slightest vestige of a trial. The last took place only a few days since.

Affairs have reached such a pass that now the bulk of the populace realise that they are now ten times worse off than before the revolution, and there is now quite a revulsion of feeling in favour of the restoration of the Manchus. This obtains, not only here, but over the whole of the province.

It is difficult to say what even a month may bring forth. Living in China just now is like camping alongside an active volcano. Yungchang-fu, about four days on the Tali road from here, has been practically burned out by the rebels and a very large number of the people killed and executed.

To complicate matters, those in power now have issued a new republican dollar, more tin than silver, and have forced it on the people, at the same time calling in all the block silver, which was up to that date the currency of the province. As a result of this I find the greatest difficulty in getting any of the merchants to accept my cheques, and thus am hard put to it to get sufficient money for my present wants. Also the price of food is rapidly rising, and through this some of my men are demanding higher wages, though at present I am paying more than double what I did in 1906. Then again these few merchants who are willing to cash my cheques charge most exhorbitant commission, giving me only rupee exchange and paying me in dollars."

Notwithstanding local conditions Forrest was able to collect freely round Tengyueh. Within a few weeks he had 35 drying presses going and on

Native Collectors in the Field

Photos, G. Forrest

Mossoo Collectors ready to start on the last journey

July 12th he was able to write: "Though the rains have been so heavy during the past fortnight that I have been out only on a few days, still I have got some more good things and the collection is steadily increasing at about the rate of 150 specimens a week. I have now some 1,100 specimens in hand, 850 of which are dried, numbered, written up and packed."

Meanwhile the Yunnanese pot was beginning to boil again. The news from N.W. Yunnan was growing worse almost daily. He heard from M. Peronne, the great collector of musk, at Atuntze that his chances of getting there that season and using it as one of his main collecting centres had completely disappeared. The local commander of the Chinese troops had unwisely beheaded ten Lamas in a local Lamaserie. This, of course, had aroused the Tibetans and the neighbouring hill tribes like a swarm of bees.

Then at the end of August the storm broke at Tengyueh itself: "I am exceedingly sorry to have to inform you that serious trouble has arisen near here and I may have to get out at any moment. You can understand how sick I feel. A very large number of Shans and many of the worst types of the disbanded soldiery are congregating two days west of here on the Bhamo road, under the leadership of the Tussoo of Kan-ngai. Their intention is to attack, loot and burn Tengyueh. They only await the decision of the local soldiers, some 700 strong, as to their joining them before they advance. The armoury of the city has already been broken open, the officials are in a helpless panic, and many people are already fleeing.

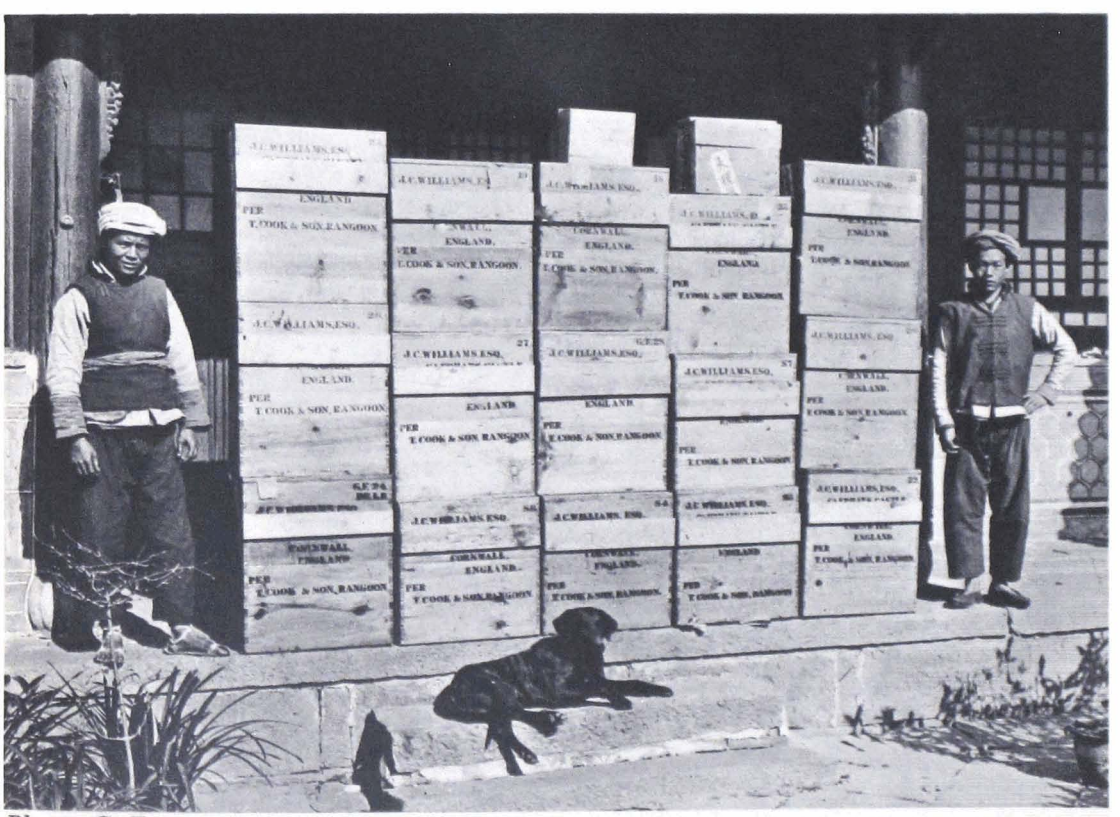
All this is just my usual luck. I think I told you before I was a Jonah. Just at the most critical period of the season. I have already over a hundred pounds of seed and fully 1,700 specimens in my dried collection; of these fully 1,400 are dried and packed, and I am taking the risk of sending them down to Bhamo disguised as Chinese export goods.

My men are only a few days in from the Shweli-Salween Divide at 11,000 ft. and have brought in some fine things, amongst them many Rhododendrons."

Early in September the storm broke: "I can realise how disgusted and disappointed you would be to receive the news of my retiral from Tengyueh, but you cannot be more so than I am. I presume you are thirsting for details as to what has really taken place. About three weeks before I left the situation became critical and Consul Smith warned me that it would be advisable to be prepared to leave for Burma in case a crisis was reached. In the end he told me that if I did not go he would accept no further responsibility if I sustained any loss. Even then I hung on. Things went from bad to worse. We were expecting a rising every evening and were kept in continual suspense. I couldn't go out collecting myself, nor could my men with any degree of safety. At last Smith insisted on my going. For my own safety I was not in the least afraid. I know the country so well that I could easily have made my escape, travelling by night and hiding during the day; but the thought of losing the results of my work was too much for me.

The danger was a rising which was being organised by those two creatures,

Seed Drying at the 'Snow mountain village' north of Li-chiang



Photos, G. Forrest

Packing Cases ready for despatch

Li-kin-yuen and Chang-men-kuan, who engineered the Tengyueh revolution of last year. They are as proper a pair of cowardly blackguards as one could meet in a day's march in any country. Both are ultra anti-foreign. As in the other provinces, in Yunnan most of the soldiers of the so-called new army have been disbanded, and each unit has been allowed to retain its full kit, including arms and ammunition, this probably in lieu of arrears of pay, held up by the local officials.

Those two braves, taking advantage of the disturbed conditions of the country, had for some months been gathering together those soldiers and as many rowdy characters as possible. Trade was practically at a standstill between Bhamo and Tengyueh. The route was closed, and I had to go to Myitkyina by the Sansi gorge. Two nights before I left the armoury was broken into and numbers of rifles and quantities of ammunition stolen.

I was told to get out, so had to. I left on the morning of Sept. 4th, beginning my journey in torrents of rain. I was walking, had twelve mules for my kit, tents, etc., and my cases of seeds and plants required over thirty coolies. Besides these I brought some of my collectors with me on the off chance that I might be able to return later. We struck north west over the volcanic hills. From Tengyueh to Myitkyina in normal weather is an eight day journey, roughly 130 miles, the route passing over a range of some 10,000 ft. which forms the watershed between the Taping and Irrawaddy basins.

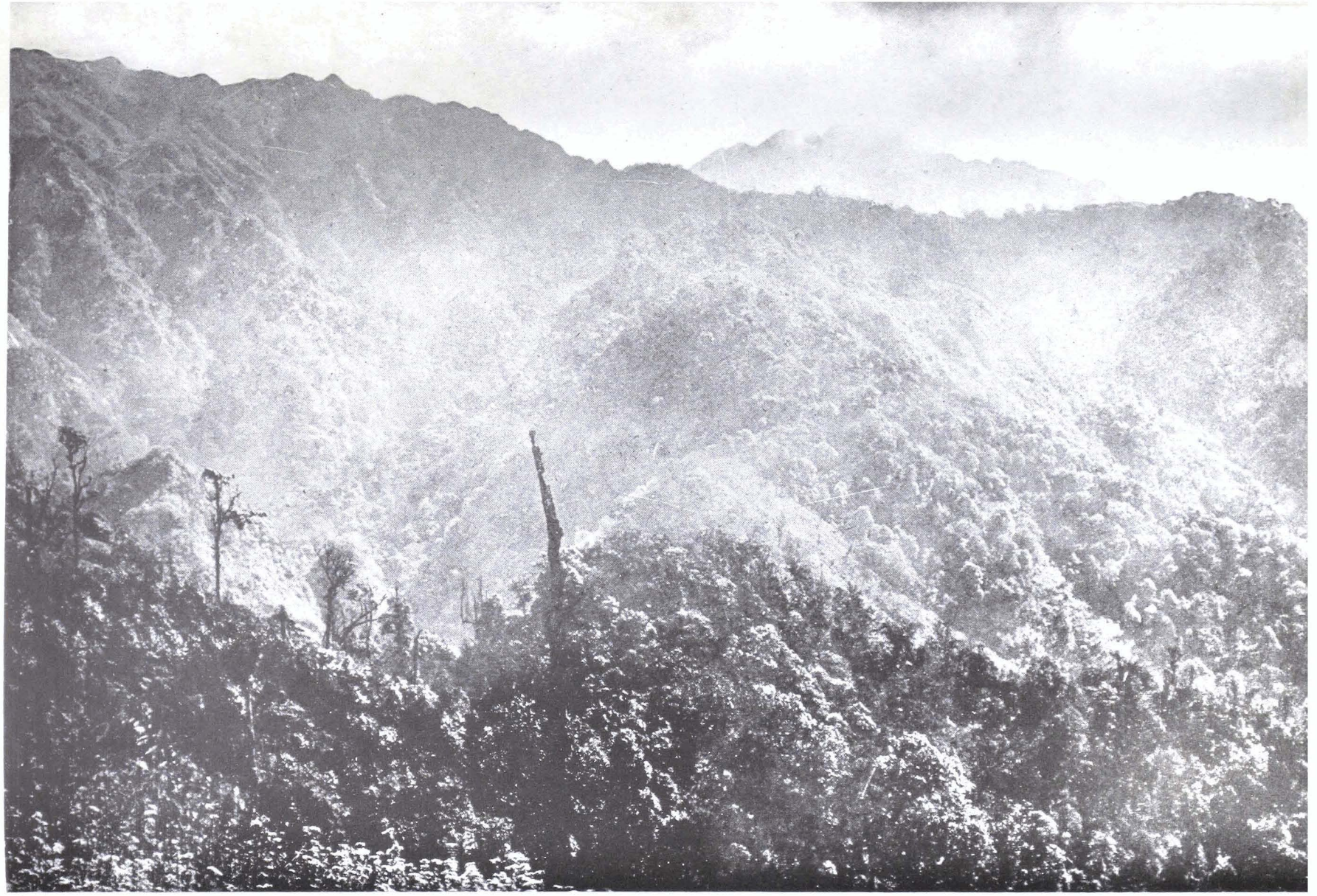
The weather was execrable. As I told you we had continuous rain for eight of the twelve long weary days the journey took us. To make matters worse I had foolishly undertaken to pilot one of the Customs men and his wife, a Cantonese woman, down the road in safety. They had been ordered out because of the wife. They had to use my furniture and tents and part of my stores. They left Tengyueh with seventeen rupees in their pockets and had one boy with them, their cook, who in turn had his wife and three youngsters.

In leaving Tengyueh we had had great difficulty in securing mules and coolies; the lot I had were the most miserable I ever travelled with and the price the highest. The coolies were opium smokers to a man. One glance into the tent I gave them to use would have shown the door closed, forty pipes going and an atmosphere you could have cut with a microtome. At times it was only by sheer force of will and a display of language which astonished even myself that I kept the gang on the move.

The journey was a nightmare. We had five large mountain streams to cross, at all of which the mules had to be towed or swam across, whilst the loads were broken up and carried over. Rain poured in solid sheets, the valleys were filled and the mountains swathed in heavy mists, and the streams continually rose. The last we crossed was about 150 ft. in breadth, just a streak of boiling beer-coloured foam with outcrops of huge boulders, the largest of these being in the centre. This was used as the central support for our bridge which consisted of eight large bamboos lashed tightly together,

hoto, G. Forrest

A natural Rock-Garden in Northern Yunnan



Rain Forest in Western Yunnan, showing the influence of the Monsoon

Photo, G. Forrest

padded with grass and foliage to prevent slipping, and carrying a slight single bamboo to hold on with. I was the last to cross, and when I did so the centre was almost submerged and the whole structure trembling. A few minutes after our crossing the whole was washed away."

At Sadon he was welcomed by the post commandant with open arms. After resting a few days he moved on to Myitkyina, the rail-head in Upper Burma.

While resting at Bhamo, the frontier town to which he had gone from Myitkyina, he wrote a letter home giving the only clear account that is known to exist of his exact methods of working. This is particularly instructive in showing the large amount of detail required to run a successful plant expedition.

"I shall have to give you an idea of my system of working. When collecting I take a rough description of the species, height of plants, altitude, associates, nature of soil, surroundings, and anything else noteworthy. These are numbered with the field numbers, and compose the material of my field book, and that of the labels. Then when the species is dried, before being written up and put away, if it be species of which I wish seed, I lay aside a sufficiently large specimen for a full description; a numbered label is attached to this tallying with that in the field book, where the species is also marked down as desirable. From these specimens, when seed has been collected, a technical description is drawn up, such as those I sent to you from Tengyueh. Also the seeds when brought in are numbered, so no mistake can arise later. These specimens serve a double purpose; when sending my men out I generally break up the party considerably, and, as all of them have not so retentive memories as myself and the chief collector, who can give me points at times, I used to take out the specimens for the day's collecting and freshen them up as to the localities of the plants."

By the middle of November Western Yunnan had settled down sufficiently for Forrest to return to Tengyueh. By the end of the month the seed harvest was in full swing, and he writes calmly about mule-loads of seeds having been brought back from the Shweli-Salween Divide by his men.

His account of one of the Rhododendrons collected on this occasion seems to indicate his first meeting with *R. sinogrande*. "One seems to be a magnificent species. The capsules are 2–2½ inches long, slightly curved, and as thick as one's thumb. The foliage runs from one foot by six inches to as much as two feet by ten inches, dark green and glossy on the upper surface, ash coloured beneath. Very handsome tree of 20–30 ft. More later."

By the end of the year he was back again in Rangoon, as all activity in the high country was completely at a standstill until April or May at the earliest. By February 1913, however, his men started collecting again in the warmer zones like the country round Tengyueh and the Shweli-Salween Divide:

"I have just heard that three more of my old Mossoo collectors have come down from Li-chiang-fu, and that some others are on their way. My chief

collector, Lao Chao, has apparently lost no time. He is a jewel. I shall give him a big present when I am finished with him. I have now seven men at Tengyueh, all busy I hear, so I expect heaps of stuff on my return. With the others coming down I should have in all twelve men working this season."

Much of this correspondence between Forrest and J. C. Williams consisted of question and answer, some of the latter being an amplification of his field notes. It is extraordinary how close the two appeared to be. Considering the time taken for letters to go to and fro, the impression is often given that they are continuing a conversation left off an hour or so before. It does not, however, make it easy to lay one's finger on the exact plant they are talking about, as in many cases neither the specific name nor the field number is given.

At the beginning of April Forrest was back in Bhamo. Here he found four of his men with the material collected during his absence in Burma. This consisted of 190 species with seed of 17. By the 19th of April he was in Tengyueh where he picked up another batch of 120 all pressed and dried with another 150 in process of drying.

He found that desultory fighting was still going on between the Chinese and Tibetans in the Upper Mekong and Yangtze Valleys, but no difficulties were placed in the way of his return to the north so long as he kept away from the fighting areas.

As 1913 was a typical collecting year it is interesting to see how he disposed of his forces. He left two men at Tengyueh under the guidance of Mr. Howell, the Commissioner of Customs, to fill in the blanks left in that neighbourhood. He left another two men at Yangpi to work the western flank of the main Tali Range. These were joined later by a further two to work the eastern flank. Three or four men went a little later when the high ground was beginning to waken to work the ranges to the north-west of Chungtien. He himself with six or eight men was left to get on with the main exploration of his favourite Li-chiang Range. This they continued without a break throughout the entire collecting season.

From Tali-fu he wrote: "I had the usual rough journey up, and, to add to the natural difficulties of the route, I experienced intense heat all the way, and for the first five days heavy thunderstorms. I had the usual downpour in the Salween Valley. What a place that is, with heat and moisture just like a regular Turkish bath. The formation is mostly volcanic clay, and now, as the rains are just breaking, the roads become like toasted cheese. Though I have travelled the road many times now, some eight or nine, never yet have I escaped rain in the Salween Valley. However I managed to get my whole troop through without a touch of fever."

There had been some frontier trouble at P'ienma a little while before. In this same letter Forrest shows how repercussions will affect even an unoffending plant collector:

"I am sorry to say I had a little trouble coming up this time, through no

fault of my own. While climbing the eastern slope of the Mekong Valley, a very narrow, and most tortuous and abrupt path, I met forty soldiers, a detachment from Yunnan-fu on their way to Tengyueh. The soldiers were most courteous, halting until I got past them. I was much ahead of my caravan, and had five of my collectors with me, two loaded with collecting boards and papers, one with camera equipment, another with rifle, etc., and one to attend my pony. After passing the soldiers, some distance further up the path, I met the officer in command engaged in making entries in a note book. I had scarcely gone another two hundred yards when one of my men called my attention to this officer and his orderly who were running up the path after us. I naturally halted to see what he wanted (he was a squat Japanese). We bowed and greeted one another, then without more palaver he commenced circling round my men examining all they carried. Eventually I got rather incensed and asked him what he wanted. He replied in rather a sarcastic tone that he simply wanted to see what my men's loads consisted of. I got mad at that, my temper isn't the sweetest at the best of times, and turning my back on him I gave the order to march. We left him standing in the centre of the roadway. When my mules turned up, I was told that this same officer had stopped my caravan and insisted on examining some of the loads. On one of my boys protesting he was beaten by one of the soldiers, and on still further protesting the soldiers threatened to shoot him.

On my arrival at Chu-tong in the Yungping Valley the local official sent his card round and requested to see my passport. I gave it to him and it was returned the next morning with the information that as it was not in order I could not proceed. He, the official, must have been a green hand and apparently fresh to the district, and not knowing me took me for a greener. I requested him kindly to point out in what the passport was lacking. He replied that though the passport bore the consulate seal, yet that of the Tengyueh Taotai was lacking. I know the Taotai's seal almost as well as I do my own. Of course the whole thing was pure bluff, and the official was acting at the instigation of the officer, who had probably wired from Yungchang to the Yungping official to stop me. In reply I sent over to the Yamen pointing out that the seal of the Taotai was alongside that of the British Consulate, that I was going on, if they cared they could stop me by force, and that I was also immediately wiring to our consul at Tengyueh. I did so and met with no opposition. In fact, I had scarcely got outside the village when his Number One man came tearing along with his card and apologies, and begged me to accept a guard of two of his soldiers. On my arrival here I had a reply from Consul Smith saying that my passport was in perfect order, that he had made representations to the Taotai, and that I should be troubled no further."

He went straight through Tali and Li-chiang-fu to his base, the village of U-lu-kaey. "This will be my base for the season, 15 miles north of the city, and from here I shall make journeys north, east and west. I have rented a house. I live in the garret, and, as the accommodation is somewhat

cramped, am continuously banging my head on the beams, but that is a detail. I shall have enough canvas life, and I really must have some place as a base. This village is the home of my collectors, and consists of some ninety houses or huts. The people are all Mossoo. The name of the village means "Snow Mountain Village". As its name implies it is situated at the southern base of the main range, just below the main peak which towers some 9–10,000 ft. above us.

That year the rains did not break until the middle of June. This melted the snow on the lower snowfields and brought on all the plants with a rush. The rains also produced the flies. He ended one of his letters: "We are afflicted with one of the plagues of Egypt just now—flies! Oh! If you only saw them. One has to wave one's arms in the air in case of breathing them! Eating is really a task!"

In one of his July letters he ended with a P.S. This is given in full, not for the particular garden interest of the plants collected, but to show the colossal wealth of the flora of such a district, for the plants in this list were collected by three men in only two and a half days.

"I cannot refrain from adding a P.S. to my letter to give you a bit of real good news, even though it should keep you on tenterhooks till you hear further from me. Some of my men have just come in from the north, three days journey, and have brought in a fine lot of stuff.

First of interest to you are eight new Rhododendrons and three more I am doubtful of. One is a fine shrub of 14–20 ft., with handsome foliage, after the *decorum* or *lucidum* type, with very large bright yellow flowers, a rich yellow with just a spot of crimson on the interior base. Some of the blooms want this.

Another, and when you read this don't think I am mad, colour blind or anything like that, has blue flowers, a real blue, as blue as those of *Cynoglossum amabile*, but a shade paler. It is a shrub of 3–5 ft. of the *intricatum* type, but with larger flowers and foliage. Another of them is *R. spinuliferum* or its brother.

Then there are three new Primulas and two more I am doubtful of. Two fine Meconopsis, one dwarf, the other after the style of *M. Henricii*, but distinct I think.

Two fine Bauhinias, both excellent shrubs, rose, and rose and white flowers. An entirely new Clematis with pure white flowers, not a form of *montana*, perianth 3 ins. in diameter of six segments.

A heavenly Iris, with flowers of a black wine shade with gold lacing on the falls, 18–20 ins.

A new Caragana with white tomentose foliage.

A new Ipomaea with foliage similarly coated.

A new shrubby Ainsliaea.

A fine new Carpinus, foliage large, dark green, bullate on upper surface, undersurface cinnamon-brown with heavy tomentum.

A new Aster with light wine-coloured ray florets.

An excellent new Vitis with deep crimson flowers and scarlet fruits.

A new Thymus, large in growth, and even more odorous than our home species.

Two Abelias, one of which is *Abelia Forrestii.*

An excellent evergreen Oak with lanceolate leathery foliage.

A new Lily, or this may be *Lilium Davidii.*

And a heap of other shrubs of lesser interest to me at present because I cannot place them."

All was not plain sailing even for such a skilful organiser and diplomat as Forrest. One of the men he left behind at Tengyueh sneaked home to his own village and was only found by Forrest after a few days. He had missed most of the seed harvest. Then some officious Chinese magistrate complained that Forrest had been mapping the country, a crime at that time owing to friction on the Burmese-Yunnan frontier. That was smoothed over with the help of Mr. Kok, the missionary at Li-chiang; but it all wasted time.

Towards the end of July he was in the middle of the busiest collecting season: "All my men are out, bar two who assist me here and who accompany me when I go out. Three have gone north to the happy hunting ground of the blue and yellow Rhododendrons; they have been away for ten days, and I hope they will remain another ten. Prolonged absence in such cases has always proved good to me. It means they have got something to keep them. Three others have crossed the Yangtze and are crawling slowly north along the eastern flank of the Chungtien Plateau. I sent them there because, though only viewed from a distance in 1904–1905, I know it to be excellent country, even more mountainous than this. This range, massive and forbidding as it is, is bisected by the Yangtze, the northern half forming the eastern barrier between the Chungtien Plateau and that huge unsurveyed tract occupied by the Lolos and drained by the Litang and Yalung Rivers. Of course I may be disappointed, but I hope for great things from that part, and, should my expectations be realised, I may spend next season in that region, making Hsia Chungtien my base, and driving my surplus men west and north, as I am now doing. But I must not look too far forward; I fear I am too ambitious, or should I say greedy?"

All his men returned a fortnight later with a good haul. He wrote home that about 200 species were new to him. By the 17th of August five cases of dried material were ready for despatch, containing about 900 different species.

While most of his men had been with him for several seasons, occasionally he made use of a fresh recruit: "Another solitary individual, a new hand, but full of pluck, has volunteered to cut right over the range from here, work along the north-west flank at an altitude of 12,000–15,000 ft. rather a feat as that side in parts is like the roof of a house, crossing again north of the main peak and returning by the base of the eastern flank. I have great hopes of this chap, quite a genial piece of humanity, but an absolute savage. I wish you could see him, bare head, legs, feet, clothed to the knees

in a single garment minus sleeves, composed of dark goat hide, hairy side out, girt in the middle with a piece of rawhide rope, and filth galore! All he wants to make him prehistoric is a stone axe. But beneath all of it there is a good fellow I think."

Unfortunately none of the letters that follow describes the end of this adventure.

There is no doubt that Forrest left a good deal to the intelligence and commonsense of his chief collectors, once he knew and trusted them. As a rule his letters do not give the exact localities in which the various groups collected, but from occasional references one gathers the freedom of movement he allowed his men so long as they collected in a given area in a given direction. He mentions that Lao Song, head man of one of the groups, went off on his own to the mountains north-west of Lankiung, one of Delavay's old hunting grounds. On another occasion two of his men were sent to the mountains around Yung-pe and found them extremely dry and barren. They cut their trip short of their own accord.

After a series of letters consisting of long discussions about various Primulas and Rhododendrons Forrest goes on to write: "I would give a good deal to have the pleasure of showing you and other enthusiasts over this range. How you would enjoy it. Large as it is I think I know the greater portion of it better than my own home hills, the Pentlands, Moorfoots and Lammermuirs!

Again I say I fear you will be grievously disappointed in your expectations regarding what you call the stories of my doings and my seeings. By now, long ere now probably, you must be aware of the fact that I am no writer. As a practical worker I may be a good average, but when it comes to describing scenery and incidents I am nowhere. It is not that I am unobservant or that I do not appreciate the beauties of nature, quite the reverse. I think that often I feel too intensely for words; on such occasions words fail me; they seem bald and unsatisfactory. I have not the journalistic instinct nor ever shall have now."

By early October the flowering season was over, and he was in the throes of the seed harvest. The amounts collected of many plants were enormous. He writes of a pound of this and a pint and a half of that so frequently that the reader is left wondering what happened to all the seed and why so few plants have been introduced from the huge harvests sent home by Forrest. In this particular instance the 1914–1918 war intervened and it was unlikely that many of the herbs would come to maturity in gardens at home; but from what is known of other of his expeditions seed was often sent home on the same lavish scale. Although his prime objective was Rhododendrons, yet the number of herbs he collected was impressive. He mentions that in 1913 he collected 67 distinct species of Primula, and of these he collected seed of 51.

On the 3rd of November he wrote: "I have now only the bulk of the Rhododendrons and a few of the shrubs to harvest, when the season, so far

as this region is concerned, will be finished. Two parties went off this morning, each of four men; one north-east and one north-west and they will secure most of the new Rhododendrons. In a fortnight they return and three weeks from receipt of this I hope you will receive the first consignment of the blue and yellow Rhododendrons. I remain here with a few men to harvest the local species of the genus. Excuse more just now. This is only a stop-gap. The northern portion of the range is coated with snow. We were camped at 12,000 ft., heavy frosts at night and several slight snowfalls. I have never felt so cold all the time I have been on the range. The blood must be getting thin or I'm a bit run down."

A week later he wrote: "I am quite all right again, as hard as whipcord, but a bit weary at times with all the hustle. I never seem to get a rest or even an hour to myself. Every minute is fully occupied. My day is from 6.30 a.m. till 11 or more p.m. with scratch half-hours for meals. However, there's a good time coming and I keep looking ahead."

Towards the end of November the harvest was complete: "I have most of my seeds numbered and packed, only some thirty or forty to finish. How many I cannot say just now; later I shall be able to give you a list, some 400 to 600 I should say, three cases, one and a half mule-loads, fully 200 pounds. So you see what you will have to face in a month or two! This is without counting the Tali lot, probably another case. I shall be glad to see the last of them. There are ten cases of herbaria containing fully 2,000 species. At Tali there may be another 1,000 species, and at Tengyueh 500, but I think we may discount at least 500 species for duplication. Allowing that, the season's haul will number fully 3,000 species."

Forrest left the Li-chiang Range shortly after this letter. He was at Tengyueh until the end of January 1914, and then spent a couple of months in Burma having a much needed rest.

As early as October of the previous year Forrest wrote about his preparations and plans for 1914: "I am making enquiries with a view to making Yungning my base for next season. It lies north-east of the Yangtze Bend, latitude 27° 50′ N., midway between the Yangtze and the Litang rivers. It lies in the centre of an arc-shaped range of mountains which forms the watershed between those two rivers, is an entirely new area, and, as I have been getting most of my best and newest things in the extreme north of the Yangtze Bend, I have felt I have been tapping the fringe of a new flora the nucleus of which lies, I think, on that divide. There is a large lake near the township, and the level of the plain is greater even than this. Within less than a day's journey there are mountains over 15,000 ft. in height. It is an exceptionally well wooded country I am told. I mean to have a try at it if all goes well."

He made his way north by his usual route through Tali and Li-chiang, reaching Yungning in early June. Then came a letter from the Yungning Valley dated June 12th: "Just a very hasty note to intimate my arrival and also my very early departure from here. I got in on the 10th and hope to

leave on my return journey on the 14th. This will surprise you, but I find I have made a miscalculation. I have struck a real dry area and am hustling to get out of it. With such a huge rain-screen as the Li-chiang Range to the south-west I strongly suspected that such a region as this existed but thought it would lie more to the south-west. Unfortunately I am wrong, and intend at once to return to my old base north of Li-chiang, U-lu-kaey, and from there work some of the beautiful alpine country I passed through on my way up, and which I also saw stretching north and west of where I was.

I had a very rotten journey up through beautiful but very rugged country, the main road a goat track! First few days heavy thunderstorms and rain, the last three a veritable 'Tierra del Fuego'. Seldom in all my wanderings here have I struck such a barren and blistering hot country as the Yangtze valley at Fengkow. A descent and ascent of some 9,000 ft. and all practically desert. We spent one night and the greater portion of a day camped on a sandbank; rocks too hot to touch, tents unbearable, climate like Rangoon in August minus the rain. If you can imagine that, temperature over 110 in the shade, brazen skies and the previous day we were at 14,000 ft.! I simply lay, gasped and drank muddy Yangtze water. And I've got to face it all over again."

A little later he was rewarded by a remarkable sight: "Another lovely shrub I should love to see growing at home as it does here is the double white form of *Rosa Banksiae*. On this journey I saw it in absolute perfection in the Lashi-pa Valley. Can you imagine a rose mass a hundred or more feet in length, thirty feet high and twenty through, a veritable cascade of the purest white backed by the most delicate green, and with a cushion of fragrance on every side? One sight such as that, and it is only one of many, is worth all the weariness and hardship of a journey from England. Looking down on the Lashi-pa Valley, which is a circular basin, backed on the east by the massive peak of the Li-chiang, one could see hundreds of those huge flower clumps showing up white even at a distance of four or five miles like bosses on a green shield. What a pity one can only bear away mind-pictures of these scenes!"

This year of 1914 was a constant disappointment. Apart from the useless journey to Yungning that wasted over three weeks of valuable collecting time it was a summer and autumn of tremendous rains in all Western China. The floods in the Yangtze and the Red River drowned hundreds of thousands. Forrest had pinned his hopes on a good season by planning more extensive trips than usual for himself and his men. He himself was going to continue his detailed exploration of the main Li-chiang Range and yet be sufficiently near his headquarters to be able to cope with all the material his men brought back.

His planning was widespread. One party went north by way of the mountains to the east of the Chungtien Plateau. From there they were to turn west crossing into the Yangtze Valley by the Mao-nui-chang, a pass

of 14,000 ft. Another party went off to the mountains enclosing the north west of the Chienchʻuan Valley, a range that lies between that and the Mekong.

The largest party of his four best men were to travel via the Yangtze Valley to Chy-tien, thence to Weisi. After travelling down the Wei Valley to the Mekong they were to cross the latter at Yeh-chih, a small place south of Tseku, climb the Mekong-Salween Divide and collect on the upper portions of that range northwards. Returning to Yeh-chih they were to cross the Kari Pass between the Mekong and the Yangtze, make for Chungtien, then cross the Chungtien Plateau to the Yangtze which they were to cross at Taku, and so back to headquarters. Much of this journey was made abortive by the Chinese authorities on the Mekong, who refused to let them cross the river owing to trouble with the Tibetans. In all Forrest had nineteen wholetime collectors working for him that year in addition to occasional local help.

During the rest of the season his letters are filled with bitter complaints against the weather. As a sample: "For the past five weeks the weather has been beyond all telling, atrocious. For three weeks I have scarce been outside the house. During that period it has rained almost incessantly. Work has been more or less at a standstill, and, though my men have gone out, they have been much hampered in their work with most serious results for me. The whole country is under water, the hills and mountains bathed in dank mist. Every forty-eight hours we have a thunderstorm of several hours' duration by way of breaking the moist monotony. Most of the neighbouring provinces are worse off than we are. The Yangtze and other rivers have been breaking all previous records and few of the ferries are open."

The news of the war in Europe that trickled in to him weeks late did not help matters. Temporarily he lost heart and constantly wrote to say how he wished he was away from the hills.

While the crop of herbarium material was poor owing to the constant rain, the weather improved sufficiently towards the end of the year to make a fair seed harvest possible, particularly of Rhododendrons and other shrubs. He left U-lu-kaey early in November and was in Bhamo in time for Christmas on his way home.

As an epilogue to this short account of the 1912–1914 expedition, here is a letter that gives a more detailed account of the kind of country in which he revelled. It is more elaborate than usual, because it was written about his journey through the hills on the way to his abortive base at Yungning. As mentioned before, this area turned out to be a failure. He had little or nothing to collect, and he had no chores to take up his time on getting to camp in the evening. Thus he had more time to write letters and less technical information to write about.

"For the first five days from here (U-lu-kaey) the country is beautifully wild and I should have enjoyed travelling had the weather been good. But,

with my usual ill-luck, rain commenced the evening of the first day, and the following morning I awoke to hear it still pattering steadily on my tent. We were camped on the flank of a deep rift running down from the main range east flank and ought to have had a magnificent view of the peak, but everything was swathed in rain and mists which billowed around us, bounding our vision to a few yards. I was much disgusted. Unless it is setting camp, there is nothing more disagreeable than breaking camp in rain. Everything dripping, tents, baggage, etc., the ground a mire from the trampling of men and mules, even the things under cover damp with the humidity of the atmosphere—and everyone's temper very raw.

Here *Primula Bulleyana* showed up in sheets in every side gully, and on every patch of pasture growing in conjunction with *Primula Poissonii*. Hybrids were brought in to me ranging from the deepest flame-crimson, through all shades of pink to the orange-buff of the type. One was a clear biscuit-coloured self without eye. I commissioned a farmer near whose hut we camped to mark down and secure seed of the best forms.

The main road, which is only a path through the forests, passes through very wild and broken country, a jumble of broken subsidiary ranges and others to the north which form the backbone of the country in the Bend. The average altitude of the road is, I should say, 11,000 ft. approximately, but there are many steep ascents and descents in crossing the ridges and valleys. At one point we rose to over 14,000 ft.

The weather continued bad for four days, heavy thunderstorms with occasional fair blinks, so I was not able to do much in the way of photographing. I snapped the peaks when opportunity offered but I fear the results won't be of any value. When a break occurred, many miles of snow-capped peaks were visible, some I feel sure much higher than that of Li-chiang. One fine evening away to the north we saw the mountains of the Chungtien Plateau stand out in all their grandeur. A magnificent sight, fully 4,000 feet of snow on them. My first sight since I travelled among them in 1904–1905. I should say in the compass of the Bend alone there is work, sufficient for many years for several Schneiders, Wards and Forrests. It is a glorious country and sure yet to produce many fine things. How I wish I had the money and freedom to explore it systematically.

All is limestone country or mostly all, and everywhere, without exception, are heavy forests from the bottom of the deepest valleys up almost to the snowline. In and on the flanks of the lower valleys and gullies are Alder, Oak, Birch, Tsuga and Pine. Higher up are Tsuga and Pine with a sprinkling of deciduous Oak, then magnificent forests of huge Abies and Picea and Larch, and last of all, Abies alone showing up in their black-green masses even above the limit of the alpine pastures. This is, I think, *Abies Delavayi*, of which I sent seed last season. Many of the Abies and Picea measured 6–7 ft. in diameter and were a good 200 ft. in height. One fallen giant I measured was fully 10 ft. in diameter 6 ft. from the base. The banks of the streams and in the gullies and valleys were clothed with a dense scrub

of many species of shrubs, most of which were known to me. Where marshy openings occurred, the turf was gaudy with the blooms of a multitude of herbaceous plants, I saw *miles*, really, of *Primula Bulleyana* and the same of *Primula vittata* and *sikkimensis*; a glorious sight. *Primula Bulleyana* seems a purely local plant; after the first two days it disappeared.

Of Rhododendrons, the spring flowering species showed up in acres, *racemosum, rigidum, rubiginosum*, mostly in open scrub, whilst in the more open Pine forests were *Rh. Fortunei* and *Rh. lucidum* in glorious bloom. In one alpine meadow there was nearly a square mile of a fine lavender-flowered form of *Rh. intricatum* in full feather. A wonderful sight which I should have liked to photograph for you, but I know no photograph would do it justice. Most of those taller forms of *Rh. intricatum* are apparently marsh-loving plants. Where limestone was not and clayey sandstone took its place, mostly in drier situations, were forests of evergreen Oak. There also *Rh. racemosum* was best, on a clayey loam.

There are some lovely spots to be seen in the Pine and deciduous Oak forests, magnificent turfy glades carpeted with *Roscoea cautleoides*, *R. purpurea*, *Cypripedium tibeticum*, *Stellera chamaejasme*, a new dwarf species of Hemerocallis with deep red-orange flowers, Anemones, Iris, etc.

The second morning was beautifully clear and I got my first uninterrupted view of the range, a magnificent sight. It runs for about 60 miles and bending off to the north-west is cut through by the Yangtze, continuing its course up the east side of the Chungtien Plateau. The whole was spread out in a panorama at a distance of some 15–20 miles, and, so far as I can, I feel sure two of the peaks are higher than the one I have been working on in past years in the south. There is also a much heavier glacier on one of them, but this could only be partially seen from where I was.

Part of the third day was occupied in passing through most uninteresting country, the formation being mostly clays and sandstones. Here was met the first population, a few scattered houses occupying terraces on one side of a valley, and here also we had our first view of the mountains on the opposite side of the Yangtze through a rugged gorge leading down to the river.

Just beyond this, I struck the richest patch of the whole journey. We had to cross a pass of some 14,000 ft. before entering the Fongkou Valley which leads down to the Yangtze. On the summit of this were four or five circular pasture basins, boggy to a degree with pools of water scattered over them. The soil was almost pure peat. Shut in by forest-clad slopes and bare limestone peaks they formed a pretty picture. Clusters of Willows and large patches of *Rhododendron intricatum* covered the drier portions, and round the margins of each pool were huge clumps of *Rheum Alexandrae*. I always understood from Wilson's writings that this was purely a pasture plant. Here at least it was perfectly at home, growing almost in water. Unfortunately only one or two of the plants, and those isolated specimens in sheltered situations, were in flower."

Forrest had a theory that the greatest wealth of Rhododendrons was to

be found in the Taron-Salween Divide and the Salween-Mekong Divide somewhere to the north of the Dokar La and west and north-west of Atuntze, that is north of latitude 28° 30′. On his next journey east in 1917 after collecting a little in the sub-tropical areas round Tengyueh he moved to Tali and then went directly to the Upper Mekong. On the 17th of July 1917 he wrote: "I am camped in the house of a Tibetan farmer, an old friend of mine of 1905. The house is on a small flat, 4–6 acres, situated in a big bend on the left bank of the Mekong. The valley here is a mere gorge, some 2,000 ft. in depth, flanks angled to 70°, air-stagnation and climate almost tropical. On every side we are enclosed by mountains, the divides rising to about 15,000 ft. with isolated peaks, such as the sacred mountain Dokar La and Ka-gwr-pu[1] of 20,000 ft. or even more, which lie only a few miles to the north, snow-capped and glacier-clad. It is a difficult and trying country to work. At our feet runs the Mekong, a raging cocoa-coloured torrent of 200 yds. breadth with a 10 knot current, rising and falling like a gigantic pulse, 16 ft. or more day by day."

He found much to be said for his theory. He went on: "Before going further I wish to point out that above a certain altitude in this region of the Yunnan province the genus Rhododendron is the dominant feature in the scheme of vegetation and I must warn you that in consequence species of that genus will bulk largely in my collections this year."

Then again: "Take the moors and hills surrounding the head waters of any of our principal highland streams in the early spring, in full flood, with patches of snow around. For heather and heath imagine mile upon mile of dwarf Rhododendron, at that season almost the exact brownish shade of dry heather and you have the scenery of the summit of the Bei-ma-shan at 15,000 ft. The raw damp wind strengthened the impression for me, and, as I stood there my heart warmed to it and I could almost imagine myself at home."

All that year of 1917 Forrest collected on the Upper Mekong, being careful not to stray actually into Tibet owing to the unsettled state of the frontier.

In 1918 there was almost open warfare between the Chinese and Tibetans in the Taron area. Although he was able to keep his Tibetan collectors at work in the same area as in 1917, Forrest was unable to go back himself and had to make his base north of Li-chiang-fu. He and his men were to work on the mountains in the very north of the Yangtze Bend, while another party was sent to Muli in S.W. Szechwan. 1918 was another year of atrocious weather: "For the past six weeks it has rained almost incessantly, and is still raining. The greater part of the Province is under water; much damage has been done everywhere to crops and roads, and conditions are fast developing into a tragedy for the poorer classes of the population. In

[1] Editor's Note. This is probably the mountain group marked on modern maps as Khakarpo.

consequence our work has been hampered most seriously, and the harvest of this season will not, I fear, equal that of last."

In 1921–1923 he repeated his work on the Shweli-Salween Divide and moved even further north on the Salween-Taron and Mekong-Salween Divides. His men again went eastwards to Muli and worked southwards to the east of the Yangtze Bend.

In 1924–1925 he did not go so far afield. The frontier between Burma and Yunnan, formed by the Nmai Hka-Salween Divide, was more thoroughly worked than ever before, and so was the wide stretch of country between the Mekong and the Yangtze centred on Weisi, 27° 20′, as well as an area far to the south round the large town of Shunning.

In 1930 Forrest started off on what was to be his last trip before retiring. He set out with the very definite intention of rounding off all his previous work in Yunnan. This required his full complement of native collectors, who were sent off with the strictest orders to fill in gaps in his previous collections, either plants collected decades ago by Delavay and other French collector-missionaries and so far missed by Forrest, or seeds of plants that he thought particularly worthy, which previously had not germinated at home or where the plants were in short supply. This expedition required the greatest skill in organisation and an enormous amount of office work. He himself rarely left his base at Tengyueh.

In one of his last letters before his death he wrote: "Of seed such an abundance, that I scarce know where to commence, nearly everything I wished for and that means a lot. Primulas in profusion, seed of some of them as much as 3–5 lb., same with Meconopsis, Nomocharis, Lilium, as well as bulbs of the latter. When all are dealt with and packed I expect to have nearly if not more than two mule-loads of good clean seed, representing some 400–500 species, and a mule-load means 130–150 lb. That is something like 300 lb. of seed. If all goes well I shall have made a rather glorious and satisfactory finish to all my past years of labour."

That last sentence has proved to be a wonderfully true epitaph. George Forrest died on January 5th 1932 while shooting within a few miles of Tengyueh.

RHODODENDRON

If there is any one genus which had for Forrest a special appeal, which above all others captivated his enthusiasm, it is the genus Rhododendron. With all his energy and with all his heart he strived for its enrichment and with it his name is enduringly and irrevocably linked.

Never perhaps in the whole long history of botany, in any other genus or at any other time, have the joint endeavours of the plant collector, guided by the botanist and inspired by the gardener, been crowned with such amazing success.

The facts speak for themselves.

Yet few people have any true notion of the real magnitude of the contribution which Forrest made to this one genus. The reader, unless he be one of the few keen gardeners or of the still fewer botanists well grounded in Rhododendron lore, I would refer, for his enlightenment, to the list of the species which Forrest collected. The full list, which is too long to publish in the text, but is given as an appendix, shows in briefest outline something of what was accomplished. Many of the listed names, indeed the majority of them, are those of species found and introduced by him; the rest, which are his introductions, were, however, first discovered by earlier botanists. The mere recitation of the total makes an impressive summary: 309 new species in 27 different series and 5375 numbered gatherings.

Forrest was, of course, singularly fortunate as an explorer in being closely associated with Sir Isaac Bayley Balfour, renowned for his work on the flora of Western China, and particularly on the genera Rhododendron and Primula. This was emphasised by the late Mr. Arthur Grove who wrote (Gard. Chron. LXXIII, 1923, p. 64) in his review of a paper published by Sir Isaac in the *Notes from the Royal Botanic Garden, Edinburgh* "Rhododendron: Diagnoses Specierum Novarum": "It was a happy train of circumstances which led on the one hand to the master being furnished with botanical material by his old pupil, and on the other ensured for the latter that brilliant exposition of his discoveries which, though no more than their importance merited, can have fallen to the lot of few explorers. The shade of Delavay may well be envious. Indeed, as Sir Isaac often said, but for the discoveries of recent times, and principally those of Wilson and Forrest, there would have been little in the genus for him to deal with. No one knew better than he the dangers and difficulties which beset the adventurer

who goes plant-hunting in Western China, and none did more to encourage the intrepid men concerned. That the lion's share of the exploration carried on during the last fifteen years should have fallen to George Forrest—himself an old Edinburgh boy—was as great a source of gratification to the late Regius Keeper as the epoch-making nature of the explorer's labours."

Forrest was fortunate too in having the generous and lively support of that enthusiastic body of men who united themselves together to found the Rhododendron Society. Among its most enthusiastic members at its inception and in its early days were: Lt. Col. F. R. S. Balfour, Lt. Col. Stephenson Clarke, Mr. Charles C. Eley, Lord Headfort, Mr. G. H. Johnstone, Mr. Gerald Loder, the Hon. H. D. McLaren (now Lord Aberconway), Mr. Kenneth McDouall, Sir Herbert Maxwell, Lt. Commander J. G. Millais, Mr. Armytage Moore, Sir John Ramsden, Mr. L. de Rothschild, Lord Stair, Mr. J. B. Stevenson, Sir John Stirling Maxwell, Mr. G. H. Wilding, Mr. J. C. Williams and Mr. P. D. Williams. All of them gave Forrest their most generous support, both financially, and through their discerning judgement on the garden side, and several are honoured and commemorated by Rhododendrons which bear their names. They founded, too, the Rhododendron Association, which no longer exists in its original form and under that name, but is still very active as the Rhododendron Group of The Royal Horticultural Society.

To do full justice to Forrest's herbarium would require a separate volume. By an unbelievable wealth of herbarium material, magnificently preserved and now beautifully mounted, no less than by his newly discovered species, Forrest has assured for himself a permanent memorial. Each of Forrest's numbers, apart from seed, represents some ten or more pressed herbarium specimens, which have been distributed to Botanical Institutions not only in Britain but in many parts of the world.

Those who are familiar with the standard work, *The Species of Rhododendron*, know that the species are arranged in 43 series, the better-known giving their names to the series chosen as representatives of the more distinctive groups. Several of the series bear the names of Forrestian plants and to no less than 30 of them he contributed. The 13 series to which he did not contribute are American, European and Himalayan, and do not occur in Western China.

Without for the moment raising the question of the validity of names—let that pass in honouring the explorer—the record stands that no less than 309 new species of Rhododendrons were founded on Forrest's material. These are listed in the appendix and each is typified in Forrest's herbarium by specimens gathered and preserved in the field or from cultivated plants raised from his seed. They are distributed among the series in the following manner:

Anthopogon	1	Barbatum	8	Cephalanthum	9
Arboreum	2	Boothii	6	Falconeri	4
Auriculatum	1	Campylogynum	3	Fortunei	7

Fulvum	4	Lapponicum	30	Stamineum	3
Glaucum	4	Maddenii	9	Taliense	39
Grande	7	Neriiflorum	44	Thomsonii	40
Heliolepis	6	Ovatum	2	Trichocladum	7
Irroratum	18	Saluenense	10	Triflorum	24
Lacteum	17	Scabrifolium	3	Vaccinioides	1

Among the new Rhododendrons which Forrest collected I have purposely included all the reputed species he discovered or first introduced, whether or not the names are still valid. All the numbers cited in the appendix are those of type specimens but some of the names should properly be regarded as synonyms, for in describing Rhododendrons there has been a tendency to over-emphasize minute and insignificant distinctions. This may be explained by the enthusiasm of the time, the wealth of material and the lack of system that prevailed as more and more material accumulated.

When *The Species of Rhododendron* was published some names appeared in synonymy, others were subsequently reduced, and, as the revision of the series progresses, still others must receive similar treatment. Yet, when the genus is fully revised and all the necessary reductions have been made, the abbreviated list will still remain a formidable one.

Finally, in estimating our debt to Forrest, mention should be made of the large quantities of Rhododendron seed which he diligently collected, often measured, not by the packet or the ounce, but rather by the pound. The subscribers to his various expeditions were frequently overwhelmed. Thousands of seedlings were raised and those who were fortunate enough to rear them soon had to extend their plantings far beyond the limits of the formal garden into their woodlands and policies. Thus arose the modern woodland garden, denoting a new technique, a revolution in gardening which has come to stay. It is, therefore, no exaggeration to say that in the evolution of the modern garden, Forrest, indirectly at least, has played a notable part.

Forrest himself published little, but, as Mr. E. H. M. Cox has remarked, he wrote regularly to some of his patrons and friends, and his letters home often comment upon the new species of Rhododendron which he gathered on his journeys. Now unfortunately it is seldom possible (because he gives no name and number) to correlate his observations with the particular plants to which they refer. Nevertheless, although his field notes were never elaborate the essential details are there.

One of the few short articles which Forrest did publish (Gard. Chron. LI, 1912, pp. 291–2) is entitled "Rhododendrons in China". It was written from Rangoon and is illustrated by photographs of Rhododendron forests on the Sung-kwei Pass. Here he refers to a region near the Burma-Tibet-Yunnan border, of which he often talked. This was a place he most desired to find, where, as he thought, the genus reached its optimum and where, as he used to say, it might have had its origin. This is how he himself described it: "Though Rhododendrons are indigenous to most parts of China, the real home of the genus is, unquestionably, those high Alpine

regions on the Chino-Tibetan frontier, which form the basins and watersheds of the Salween, Mekong, and Yangtze." . . . "There, somewhere about 98°–101°E. long., and 25°–31°N. lat., the genus reaches its optimum." On the general distribution of Rhododendrons he observes: "The range of altitude is practically from sea-level to the limit of vegetation, except for a few low-level types." . . . "From 5,000 ft. upwards they occur as isolated specimens or small groups growing in thickets and forests of mixed dicotyledonous shrubs and trees, gradually increasing in numbers up to 10–14,000 ft., at which point they form the dominant feature in the vegetation either as undergrowth in the forests of Conifers, or by themselves as dense thickets and forests. The lesser species take the place of our Heath or Calluna, carpeting miles of the Alpine pasture, both above and below those forests.

"In stature they vary from the tiniest Alpine of 6 in. or less, such as *R. campylogynum* to trees of 30–45 ft. in height, as *R. lacteum*[1] and *R. calophytum*. In colour of flower they range from the darkest purples, through all shades of crimsons, scarlets and pinks to pure white, and some are also of the clearest and brightest yellows.

"With the exception of a few species, such as *R. racemosum*, *R. lepidotum* and *R. decorum*, all are peculiarly local in their distribution, in latitudinal, longitudinal and altitudinal range. Only a few of the species found in the Yangtze basin are common in the areas drained by the Mekong or Salween, and vice versa. Many of the lateral spurs of the huge ranges separating those basins bear species indigenous to themselves alone.

"The flowering period for most species is in April to June, and, at that season, the forests, with their wealth of bloom, form a scene of indescribable beauty, and paint the flanks of the mountains with bands of the richest colours."

One point which Forrest was wont to stress (and now I quote from a lecture which he delivered to the members of the Rhododendron Society in 1920) is that "nearly all Rhododendrons under natural conditions are social plants, a fact which, were we to acknowledge it in our treatment of them, would tend to a greater success in their cultivation. Very few are found as isolated plants. . . ." To this general rule, however, *R. Griersonianum* and *R. spinuliferum*, he states, are exceptions. "But all others are found in masses, covering from acres to square miles in extent, and where one species does not entirely dominate a situation several or many have apparently adapted themselves to the environment for the necessary mutual protection. This is especially evident in some of the deeper side valleys of such a range as the Tsang-shan, the mountains which form the western boundary of the Tali Valley, where one finds Rhododendrons *brachyanthum*, *neriiflorum*, *haematodes* and others, whilst luxuriating in their shade, is seen the beautiful *R. campylogynum* with its minute Buxus-like foliage and graceful plum-

[1] Later identified as *R. fictolacteum*

coloured solitary blooms. At higher altitudes and more open situations the tree-species form impenetrable thickets and forests of vast extent to the complete exclusion of all other ligneous vegetation, banding the mountain sides with colour, and presenting in late May or June scenes of indescribable beauty. These forests may contain many species, and this is generally so, though often one species (such as *R. Traillianum*) is dominant. One interesting feature is that the greater number of species are most luxuriant in situations having a northern or north-eastern exposure."

Another topic connected with the cultivation of Rhododendrons, dear to the heart of Forrest and often discussed in conversation, was the possibility of growing Rhododendrons on limestone or in a soil containing lime. Forrest maintained that in Yunnan "a host of species have their roots fixed in the crevices of limestone cliffs and boulders or in a limy rubble at the bases thereof. The taller tree species, though having a bed of humus for support, have their rootlets similarly placed, or at least overlying or in contact with limestone." In a letter to J. C. Williams, dated 31.5.13, he remarked: "The Rhododendron authorities talk of the impossibility of growing Rhododendrons on limestone. I wish I had them here just now to see *Rhododendron chartophyllum* and its form *praecox* miles (no exaggeration!) of bloom, and every plant on pure limestone, many growing on the bare rock. Enclosed is a photo of the species. The above applies to almost all the species on the range. I think I may manage to secure photos this trip which may convince them!" In support of this contention Forrest later published his photograph in the *Gardeners' Chronicle* (LXXXII, 1927, p. 427).

Since on the Li-chiang Range Rhododendrons are dominant on pure limestone, Forrest was strongly of the opinion that something ought to be done to convince Rhododendron growers that these plants are not altogether intolerant of lime. Stimulated by Forrest's observations and by suggestions made by Bayley Balfour, a number of serious attempts were, in fact, made to prove his contentions and to grow Rhododendrons in a calciferous soil. For example, Col. F. C. Stern, whose garden at Highdown is on pure chalk, found means of growing Rhododendrons even there, and he still continues to grow them on specially made platforms. Then the late Mr. A. Grove carried out a series of experiments in his Berkshire garden, using many different species, which he eventually graded according to their degree of lime tolerance. But the truth is, of course, that Rhododendrons are to a greater or lesser degree, and mostly to a greater, definitely calcifugous and the theory is now perhaps one of academic interest rather than of practical application. The subject need not, therefore, detain us, but the interested reader will find a full account of Mr. Grove's experiments in the *Gardeners' Chronicle* (LXXXII 1927, pp. 426–8).

In another letter to J. C. Williams a further field observation is made which may be of interest to those who grow Rhododendrons. Forrest wrote: "The photos I wish particularly to draw your attention to are those portraying the new features of growth where the Pine forests were burnt. When last

Colour Photo, J. E. Downward

RHODODENDRON GRIERSONIANUM

I was here in 1910 those areas were densely clothed in forests of Larch, Pine and Abies, with an undergrowth of dwarf, 1–2 ft. evergreen spinous-leaved Oak, and straggly, drawn up specimens of such Rhododendrons as *Fortunei*, *racemosum*, *praecox* and *lepidotum*. The cause of the fires is immaterial. The forest was probably set alight intentionally to obtain dry timber, the tribes people have most weird and improvident methods. What I wish to point out is the marvellous hardiness of the Rhododendrons to withstand such a fire when the heavier timber succumbed, and also the remarkably symmetrical growth of each of the species since the time of the fire. On an average the shrubs are from 2½–3 ft. high, by about as many or more in diameter, and I don't think I have witnessed such a fine sight as the mass of bloom borne by each individual plant, the size and purity of those blooms, and the extremely artificial aspect of the whole scene caused by the regular spacing of the plants. This last would strike you in the photographs where, however, it shows to comparatively little advantage. The whole scene gave one the impression as of having been laid out by an expert landscape gardener, as indeed it had by nature! What of course contributed largely to the general effect was the splendid groundwork of compact masses of the glossy dark green foliage of the evergreen Oak from amidst which the plants arose. It formed a most admirable setting.

"One thing is certain, and that is, that, in their native habitat at all events, these Rhododendrons agree wonderfully well with a set-back. I examined many of the plants, and without exception, they had been burned right down to the ground surface. Why not try the same with *Rhododendron Fortunei* etc., at home? I do not suggest your burning down your timber, but to have the plants cut back to a few inches every three years or so. It was quite by accident that I dropped on the spot. I was tracking for another part. Now I wish I had taken more photos of the area, there must have been several miles of it."

Many of Forrest's Rhododendrons are so well known that it would be superfluous to attempt to describe them all in detail. I propose rather to pick out a few of the more outstanding as ample evidence of the debt we owe to him, and in reminding you of them, to note where and when he found them, adding to my comments what he himself and others may have said about them.

There is no better species than *R. Griersonianum* with which to begin, when making a selection. This he first found in June 1917 at the head of the Shweli Valley on the Shweli-Salween Divide, near the Burma frontier. His field description (Rhod. Soc. Notes II, 5) was "a most symmetrical shrub; in open country; attaining a height of 5 to 8 ft.; with large blooms of a most beautiful shade of rose-scarlet, almost vermilion in some lights; one of the finest bits of colour I have ever seen."

In the Rhododendron Handbook *R. Griersonianum* is classed as "C" (hardy along the seaboard and in warm gardens inland); none the less, it survives and can even be said to flourish in some east coast gardens. In the

Rhododendron house at Edinburgh a remarkable plant, grown from Forrest's seed sown in 1918, is now 10 ft. 6 in. high and 36 ft. in circumference. Every year it produces between three and four hundred trusses of flowers, usually in May.

R. Griersonianum is, in the words of Bean, "one of the most valuable of the amazing crowd of Rhododendrons our gardens owe to the labours of George Forrest" (New Flora & Silva, I, 33). It is so well known and so acclaimed that it needs no eulogy to extol its merits. Its record speaks for it. In the Rhododendron Stud List (in the Rhododendron Handbook) it takes pride of place with no less than 122 different named hybrids: "Tally Ho", "Fabia", "Fusilier", "May Day", "Elizabeth" and "Grierdal" are among the more outstanding.

Undoubtedly *R. Griersonianum* prefers the milder climate of the south and west to the sterner conditions of the east. In spite of Forrest's observations, to give our plants in Scotland the ruthless pruning which their counterparts receive so successfully at the hands of Colonel Bolitho at Trengwainton in Cornwall would, to say the least, be ill-advised. Yet they are by no means as tender as is often supposed. Writing of *R. Griersonianum*, Cox, who grows it in the Carse of Gowrie in Perthshire, observes (New Flora & Silva, VI, 8) "In our experience, once it has passed a foot in height, it is most satisfactory, absolutely hardy." Indeed, disagreeing with Armytage Moore, who chose *R. fictolacteum* to illustrate "What is a good plant?" Cox (New Flora & Silva, XII, 162) chose rather *R. Griersonianum*, giving his reason that "it is a striking and lovely colour, a new departure except for one or two of the Javanese species. It has a good habit and flowers quite young. It is a size that makes it suitable for most gardens. It flowers when shrubs in flower are none too common, a good mid-season plant. It grows well under adverse conditions in our hard and dry climate on the east coast of Scotland. It makes an admirable cut flower, graceful and lasting a long time in water."

Another of his outstanding species, *R. Taggianum* (F. 26440 type), with very large, trumpet-shaped, fragrant flowers, pure white, marked with a yellow blotch at the base, and unquestionably "the gem" of Forrest's 1925 collection, flowered for the first time in this country in 1930, at the Royal Botanic Garden in Edinburgh. Although it comes from fairly high altitudes —the seed was collected at 10–11,000 ft. near Pan-ti-La on the western flank of the Nmai Hka-Salween Divide—it is very definitely not generally hardy (classed as "E"). Nevertheless, it can be grown and has flowered outside in favoured gardens in Cornwall and even in Scotland, for example, in the garden of the Duchess of Montrose at Brodick. It gained The Royal Horticultural Society's Award of Merit in 1932 and a First Class Certificate in 1943.

Mention may next be made of *R. sinogrande*, which, like *R. Taggianum*, flowered for the first time in this country under glass in Edinburgh several years before it flowered in the open. This was a notable event but caused

RHODODENDRON
TAGGIANUM
"The gem" of
Forrest's
1925 Collection

Photo, R. A. Malby

RHODODENDRON
SINOGRANDE

Photo, J. E. Downward

less sensation than the incident which I now describe. One morning, in early May 1934, the late Mr. John A. Holmes arrived at the Royal Botanic Garden bearing an immense truss of *R. sinogrande*, which he had picked the day before in his garden at Arisaig and had brought to Edinburgh in order that I might see and admire it. He had walked the length of Princes Street carrying shoulder high the huge truss, supported with gigantic leaves, like a magnificent umbrella. On the way he was stopped, questioned and, as he told me, almost mobbed, but at last in triumph he reached the garden.

Forrest, when he discovered *R. sinogrande* in 1912, described it as the finest species found in the forests on the western flank of the Shweli-Salween Divide. It is unquestionably one of the most noteworthy species he introduced.

Another species of the same series—*R. giganteum*—is an even more striking plant, at least in the gardens where it flourishes. But this is a rare plant in cultivation for it is very tender when young and, although many seedlings were raised, most of the young plants did not survive for long after they had been planted out to take their chance in open woodland, even when given protection in the most sheltered bays.

The flowers of *R. giganteum*, decidedly larger than those of *R. sinogrande* —the corolla tube may be as much as 4 in. long—are of a rich rose-crimson. Forrest, in his lecture to the Rhododendron Society from which I have already quoted, said: "Again, last autumn on one of our last journeys to the foot-hills of the Nmai Hka-Salween Divide we found what is at present the tallest known species in the genus now named *R. giganteum*. Only a few specimens were seen though possibly it may yet be found in greater numbers in other areas. The largest tree was measured. The height just reached 80 ft., the spread of branch over 40 ft., whilst the trunk at 5 ft. from the ground was 7 ft. 9 in. in girth. The bark is rough for a Rhododendron and of a light greyish-red colour. The largest leaves ran to about 13 to 14 in. Unfortunately the species being apparently an early flowerer, as many of that region are, we only secured specimens in fruit, leaf and flower-bud, the latter too immature to give even a hint as to the colour or form of the flower. A fair quantity of seed was collected."

When lecturing to the Society in 1923 he remarked, "Whilst passing through the latter district (the mountainous country east and north-west of Tengyueh) on my way east in March, 1921, a short journey was made to the frontier hills to get good flower specimens of *R. giganteum*, which had not been collected in 1919. We were fortunate in finding the plants in full bloom. In keeping with the prodigious growth of the species the inflorescence is of great size, individual trusses having as many as 15–20 large fleshy blooms, each 2½–3 in. in length by 1½–2 in. across, in colour deep crimson throughout, or deep rose-crimson shaded to almost white at base, with a deep crimson blotch. It is, assuredly, a magnificent species, apparently very rare for, though further search was made, only the three specimens found in 1919 were seen."

Photo, D. Wilkie

RHODODENDRON GIGANTEUM

He felled one of the largest trees in order to measure it, and a section 2 ft. 1 in. in widest diameter, taken from a point 12 ft. above the ground, now rests in the museum at the Royal Botanic Garden, Edinburgh. *R. giganteum* flowered for the first time in this country in 1937 at Arduaine, near Oban, in Argyll, and Lady Campbell then sent me the first truss which opened. Since then I have had the pleasure of seeing the Arduaine plant in flower, more than once, where now some 15 ft. high, it continues to grow vigorously and flowers every year. Subsequently other plants have flowered at Brodick, in Cornwall and elsewhere.

Yet another well-known plant in the same series is *R. praestans* (F. 13023 type), which is illustrated by one of Forrest's photographs, taken on the Kari Pass on the Mekong-Yangtze Divide in 1914. The flowers are magenta-rose with a crimson blotch at the base. Forrest observed, "Unfortunately in most instances it is utterly impossible to photograph those large tree Rhododendrons. They form impenetrable jungles, stems bare and rugged to almost their extreme height, with an umbrella-like mass of foliage and flowers at the top. If not in that form they are branched from the base, with scattered trusses of flowers at the end of the branches, all being in dense shade where an exposure of very many seconds would be necessary to produce decent negatives. As the wind rises with the sun at these altitudes the conditions are prohibitive."

Among the best known of the big-leaved Rhododendrons which Forrest discovered are *R. basilicum* and *R. arizelum*, in the Falconeri series, both closely allied to the species of the Grande series which we have just been considering. *R. basilicum* was found at 11–12,000 ft. in the Shweli-Salween Divide in 1912 and *R. arizelum* at the same elevation and in the same locality in 1917. Of *R. basilicum* Forrest remarks, "the flowers, as numerous as in *R. sinogrande* but of a better form and substance, are pale yellow with a crimson blotch. I have seen blooms of this species heavily flushed with crimson."

Still another noteworthy plant in the series is *R. fictolacteum*, of which a number of forms are in cultivation. One of the best, bearing large trusses with flowers of a delicate rose (F. 22020), was found by Forrest in 1922 at 11–12,000 ft. on the Chienchʼuan-Mekong Divide.

In writing of this species it is interesting to recall a mistake that was made and the confusion with regard to it and *R. lacteum*. Plants which had been raised in the Jardin des Plantes from seed sent to Paris by Delavay bore this name. Seedlings had been widely distributed and plants were already well established in cultivation. The first record of their flowering was in the garden of M. P. L. de Vilmorin at Verrieres-le-Buisson in 1908, but two years later another of the same set of seedlings reached flowering size in this country. From specimens obtained from this plant, in the garden of the late Mr. F. D. Godman at South Lodge, Horsham, a plate was prepared, which was published under the name *R. lacteum* in the *Botanical Magazine* in 1911 (t. 8372). But this handsome plant, with large white flowers

RHODODENDRON
FICTOLACTEUM
in the Wild

Photo, G. Forrest

marked with a crimson blotch, was not the true *R. lacteum*! It turned out to be a new species and was given the name *R. fictolacteum*.

How a mistaken entry on a herbarium label caused the confusion is very fully explained by Bayley Balfour in two articles, one in the *Gardeners' Chronicle* (LIX, 1916, p. 168), the other in the *Transactions of the Botanical Society of Edinburgh* (XXVII p. 91), which he wrote in 1916. Forrest's gatherings and observations in the field had drawn attention to the error. Balfour, who had secured authentic material from the herbarium in Paris, saw that the plant with white flowers marked with a crimson blotch, figured in the *Botanical Magazine* as *R. lacteum*, was not *R. lacteum* but quite a different species. It had, however, been described by Franchet as *R. lacteum* var. *macrophyllum*. The yellow-flowered *R. lacteum* and *R. fictolacteum* are of course markedly different, not only in the colour of their flowers but in their indumenta, and now they are no longer closely associated in our minds, since they are placed in separate series in *The Species of Rhododendron*.

But the story is not yet complete. Another plant, quite different again, also bore the name *R. lacteum*, for a time, when it first came into cultivation. Collected by Wilson (No. 4254), this plant—another new species—was later named *R. galactinum* by Balfour.

As to the true *R. lacteum*, which is generally agreed to be the finest Rhododendron with yellow flowers, it was itself eventually figured in the *Botanical Magazine* (t. 8988). Although Forrest did not discover it he introduced it to cultivation. When he first found it, Forrest thought that he had discovered a new and rare species, but it proved to be the same as one which Delavay had collected earlier. During several years of collecting Forrest had seen only two groups of it, but subsequently he found that, although restricted in its distribution and confined to the mountains above Tali Hsien and their north-eastern extension to the Kua-la-po, it is abundant in parts of this region. Nearer Tali Hsien it occurs scattered, as undergrowth in pine forests, but on the Kua-la-po it forms almost pure forest.

R. lacteum is by far the most attractive species in the series to which it gives its name; but in spite of the delicacy and beauty of its canary-yellow flowers it is not, however, generally regarded as a plant of exceptional garden merit. Firstly, it is apparently short-lived; many plants have died at an early age, blooming only for a few consecutive years after they have come to maturity. Regarding two of the plants which he had at his garden at Wexham Place, Stoke Poges, Mr. S. H. Wilding wrote in 1921 (Rhod. Soc. Notes II, p. 85), "They died in the most annoying way. Despite care and attention, shade and water, they slowly expire bit by bit, first one branch then another, then total collapse." Secondly, although *R. lacteum* is reasonably frost hardy, it blooms so early in the season that, unless the flowers are protected, the opening flower-buds are often destroyed by a few degrees of untimely frost. Finally, from the grower's point of view, there is the further

disadvantage that seed seldom matures and only a few hybrids have been raised.

While all this is true, and for the reasons given many hesitate to regard *R. lacteum* as a first-class garden plant, yet one has only to see it as it grows at Exbury, at Lochinch, at Blackhills and in many other gardens, fully to appreciate its great and rare beauty.

As to the rest of the series—and all but one were found by Forrest—*R. Beesianum*, "with large blooms which are fleshy and crimson-rose in colour", is, in my opinion, the best. Forrest himself, however, thought more highly of *R. Traillianum*, with smallish flowers, which are white or white flushed rose with deep crimson spots, arranged in a rather tight and compact truss. At any one time I have seldom seen more than an odd truss on a single plant and I know of no connoisseur who would rate the plant very highly. None the less, it has one feature of particular interest—its unique indumentum. On this account it is one of the easiest Rhododendrons to identify. When the indumentum is scraped off the leaf and placed on a glass slide in a drop of methylated spirit the hairs on the under side of the leaf immediately float apart. Each is a distinctive beautiful little star-like structure composed of 5–8 minute pear-shaped, radiating cells, joined together at the base by the broader ends in a tiny rosette. A single glance at any one of those hairs under the microscope is enough to identify it and to determine the species to which it belongs.

With regard to species of the allied Taliense Series, which are often regarded by gardeners as the Cinderellas among Rhododendrons, there is at least one which, in my opinion, will hold its own with any other Rhododendron. I refer to *R. detonsum* of the Adenogynum Subseries, which was discovered by Forrest in May 1917 on the Sung-kwei Divide (F. 13789 type). Seen at its best, it is laden with trusses of delicate rose-pink, crimson spotted blooms, a shrub of pleasing proportions, pyramidal in shape, with the long lower branches spreading so that they conceal the stem and completely cover the surrounding ground.

Yet another member of this disparaged series deserves to be mentioned, for Forrest himself held it in high esteem. "*R. Clementinae*", he remarked in 1914, "is one of the finest species we collected." He is not alone in this point of view, for Dr. J. Hutchinson, in his account in the *Botanical Magazine*, begins with the following words: "One may perhaps imagine the feelings of the late Mr. George Forrest when he discovered this magnificent Rhododendron in open thickets on the mountains of the Chungtien Plateau in August 1913. With characteristic brevity Forrest merely remarks at the foot of his description, 'The species is dedicated to my wife' " (Bot. Mag. t. 9392). Bean less enthusiastically describes it as "one of the most ornamental of the Taliense series". The flowers are "deep pink or creamy-white flushed rose and margined deeper with no markings". The species is common to N. W. Yunnan and S. W. Szechwan.

Of less account, yet noteworthy because of its growth, is the dwarf,

Colour Photo, J. E. Downward

RHODODENDRON LACTEUM

at Tower Court, near Ascot, Berks.

curiously congested *R. Roxieanum* (F. 12609 type). Under this name I would, with Hutchinson (Bot. Mag. t. 9893), include five other closely allied "species" of the same subseries. Sir W. Wright Smith had previously expressed the view that "with the very ample material of this series now available I can come to no other conclusion than that we have too many names centring around *R. Roxieanum*. . . ." "One is almost forced to the conclusion that here we are dealing with one variable species and that nothing is to be gained by trying to subdivide. . . ." *R. Roxieanum* was found by Forrest in 1913 and the plants described as *R. recurvum*, *R. aischropeplum*, *R. coccinopeplum* and *R. poecilodermum* were all collected by him from 1917 to 1918. Taken as a variable species it may be said to range over the Mekong-Salween Divide, S.E. Tibet, N.W. Yunnan, the Muli Mountains of S.W. Szechwan, and N.E. Yunnan, where it grows on open rocky moorland and boulder strewn slopes at altitudes of 10–13,000 ft. In cultivation *R. Roxieanum* matures slowly, taking a long time to reach a flowering age. Eventually, when the flowers do appear, they are white tinged with carmine pink, spotted on the upper side with many small, horseshoe-shaped, crimson markings.

In the Irroratum Series "the truly magnificent" Rhododendron, *R. prophantum* (F. 17928 type) of the Parishii Subseries, is worthy of special notice. Forrest found it in June 1919 on the Nmai Hka-Salween Divide. Though given a distinctive specific name it was later identified with Kyaw's plant, *R. Kyawi*, which was found by Naung Kyaw of the Burmese Forest Service in the Kachin Hills in 1914. Yet it is true that the leaves of Forrest's plant are covered with a very distinct, subpersistent indumentum of stellate hairs, while the leaves of Kyaw's plant are all but glabrous. Forrest's plant might well be distinguished by a separate varietal name. This magnificent species reaches a height of some 20 ft., carrying trusses of 12–16 very large, fleshy, unspotted, deep crimson flowers, which appear in early July or August; but unfortunately this is a tender plant (classed "E" in the Rhododendron Handbook), and can be grown in the open only in the most favoured gardens. A fine specimen, showing the distinctive indumentum, may be seen in the Rhododendron house at Edinburgh.

The Fulvum Series takes its name from another Forrest species well worthy of notice. *R. fulvum* (F. 8989 type), considered, when first discovered by Forrest in 1912, to be a plant confined to the Shweli-Salween Divide, was later found to have a much wider distribution. It is, indeed, not confined to Yunnan but extends to Szechwan, Burma, Tibet and Assam; a shrub up to 18 ft. high, a striking plant, not only when in flower but also when in leaf, because of the rich, rusty-red indumentum. Forms to which the name *R. fulvoides* was given have a tawny indumentum. As there is, however, no other distinguishing feature and as *R. fulvoides* is not, as was originally thought, the northern representative of *R. fulvum*, there appears to be but a single variable species. This species is very easily identified by its characteristic mop-like hairs. It is now widely grown.

We owe to Forrest the fact that several species of the Fortunei Series, at one time rare in cultivation, are now plentiful. This is true of *R. decorum*, which had been introduced by Delavay, for Kew obtained seedlings from the Jardin des Plantes as long ago as 1889. Although Wilson also had collected seed of *R. decorum*, it was a rare plant in cultivation until Forrest found it on the Li-chiang and Tali Ranges. The full history of its introduction is recounted in the *Botanical Magazine* (t. 8659) and the truss figured there was taken from a plant raised by Mr. J. C. Williams at Caerhays from Forrest's seed. *R. vernicosum*, too, of this series, was uncommon in cultivation until Forrest introduced a number of variant forms. These were in the first instance given distinguishing specific names—*R. rhantum*, *R. euanthum*, *R. Sheltonae*—but the species is now known to be variable and the names are usually regarded as synonyms. One of the most outstanding plants in this series, for which we are indebted to Forrest, has been regarded as a fine form of *R. decorum* with a yellow eye, but it is worthy of a distinctive name and has recently been described as *R. chlorops*.

Turning now to the Neriiflorum Series, we may remark that, although Forrest did not discover *R. neriiflorum*, he has the credit for its first introduction. Everyone will agree that this species, "one of the most richly coloured of Chinese Rhododendrons", is worthy of a place in every garden. Describing the Tali Range, Forrest records in one of his letters that "in shady places, such species as *R. neriiflorum* and *R. haematodes* eclipse everything in beauty with their cherry-coloured and deep crimson blooms", and this we may well believe.

The beautiful Rhododendron which commemorates his name, *R. Forrestii*, (F. 699 type) in the same series, was discovered in 1905 and introduced in 1914. This dwarf, prostrate, "most interesting shrub, with large fleshy flowers of a deep crimson shade," was found on the Tsedjiong Pass on the Mekong-Salween Divide. From the same locality Forrest subsequently introduced another plant, which Bayley Balfour regarded as a distinct species, giving it the name *R. repens* (F. 14011 type). In gardens both names are well known, but the only difference between *R. Forrestii* and *R. repens* is that the leaves of the former are a deep reddish-purple on the undersides (owing to the presence of anthocyanin), while those of the latter are pale green. This Dr. O. Stapf emphasised, when writing in the *Botanical Magazine* in 1930 (t. 9186), and there he regards the names as synonymous. If we accept Stapf's view (and it is undoubtedly a correct one), plants under the name *R. repens* should all be known as *R. Forrestii*. Various varieties are less prostrate in habit, and have several flowers to a truss. Under the name *R. repens*, one plant, which does remarkably well at Tower Court, Ascot, received a First Class Certificate when exhibited by Mr. J. B. Stevenson in 1935.

In the Haematodes Subseries the species *R. catacosmum*, *R. chaetomallum*, *R. chionanthum*, *R. hemidartum* and *R. pocophorum*, which are well-known garden plants, are all Forrest's discoveries.

RHODODENDRON
NERIIFLORUM

Royal Botanic Garden,
Edinburgh

Photo, R. M. Adam

Among the dwarf Rhododendrons of the Sanguineum Subseries the most notable of those which were discovered and introduced by Forrest are perhaps the "black-crimson" *R. didymum* (F. 20220 type) and *R. haemaleum* (F. 5073 type) which, again, as Stapf has pointed out (Bot. Mag. tab. 9217), are very closely allied. These are now (Notes from the Royal Botanic Garden, Edinburgh, XCVII, 1940) both regarded as subspecies of the very variable *R. sanguineum*. *R. dichroanthum* (F. 4138 type) with the subspecies *apodectum* (F. 18153 type) and *scyphocalyx* (F. 18050 type) were also first discovered by Forrest. They differ in the presence or absence of minute glands and in the calyx; the best forms have flowers of a deep attractive orange.

Of the many species in the Thomsonii Series which we owe to Forrest, none is more attractive than *R. Meddianum* (F. 15767 type), the "Chinese Thomsonii", which, like the Himalayan counterpart, has loose trusses of large, very handsome, richly coloured, bright red, waxy flowers. Others of the same subseries, now common in cultivation, include the variable *R. Stewartianum* (illustrated opposite), and *R. eclecteum* with its several varieties, while *R. cyanocarpum*, earlier discovered by Delavay, was introduced by Forrest in 1906.

In the Campylocarpum Subseries the most notable Forrest introductions are the two closely allied species *R. callimorphum* and *R. cyclium*. *R. callimorphum* (F. 12019 type) was found on the Shweli-Salween Divide in 1913 and *R. cyclium* (F. 18044 type) on the Nmai Hka-Salween Divide in 1919. The two species are, however, inseparable. Dwarfer forms with smaller leaves are perhaps the more beautiful, but all are charming plants with delicate flowers of a deep rose and with rounded leaves. Not unlike *R. cyclium*, but quite distinct with its white flowers, we have also *R. myiagrum* (F. 17993 type), "the fly catcher". It gets its name because of the sticky glands on the flower stalks. Through an accident, an unwary insect, ensnared by one of these glands, was brought to this country on a herbarium specimen and thus the plant obtained its name, but the same characteristic may be observed on any garden plant.

R. Souliei is a Szechwan plant which Forrest did not find, although he searched for it. In a letter dated 26.6.13, he writes, "The last time I was out I went specially to secure photos of plants and flowers of *Rhododendron Souliei*. We had an awful day, starting at 6 a.m., returning twelve hours later, three thunder storms almost immediately after one another at 13,000 ft., snow, sleet, and drenching cold rain. However I secured my photos and they are now printing as I write." The plant to which he referred was later named *R. jucundum*. In the Souliei Subseries his most noteworthy plants are the yellow *R. croceum* and the pure white *R. puralbum*.

Many of the species in the Selense Subseries attributed to Forrest are more correctly regarded as forms of the variable *R. selense*. The more noteworthy are *R. jucundum*, to which we have already referred, *R. setiferum*, *R. vestitum* and the yellow-flowered *R. panteumorphum*.

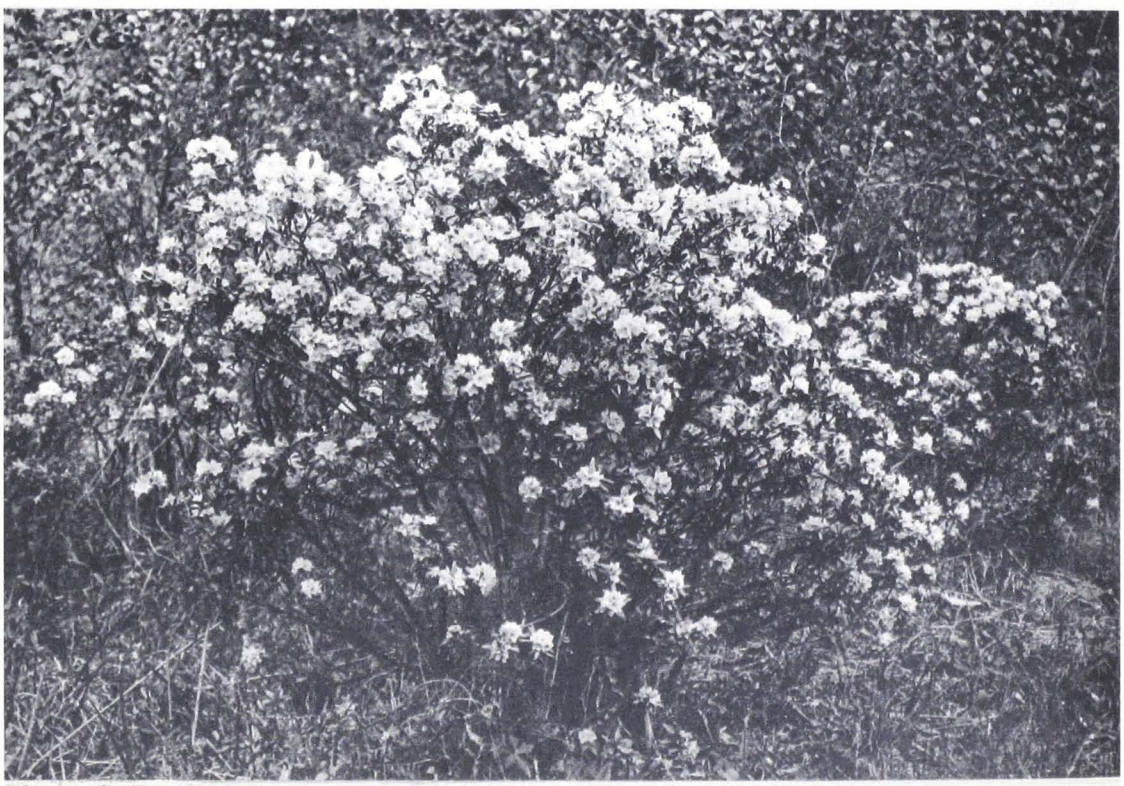
Photo, N. K. Gould

RHODODENDRON STEWARTIANUM AT WISLEY

Photo, G. Forrest

RHODODENDRON PRAESTANS IN THE WILD

RHODODENDRON SALUENENSE IN THE WILD



Photos, G. Forrest

RHODODENDRON FASTIGIATUM IN THE WILD

To Forrest also goes the credit for discovering and introducing many dwarf lepidote species in the Lapponicum Series. Amongst those which have been given awards are *R. russatum*, *R. scintillans*, *R. impeditum*, *R. fastigiatum* and *R. hippophaeoides*. *R. russatum* (F. 13915 type), with which *R. cantabile* (F. 16583 type) ("worthy to be sung") is now united, is a small shrub 2–3 ft. high, with deep blue-purplish flowers, which appear in March and April. It was acclaimed by Mr. J. C. Williams as the best of the Lapponicum group, and secured an Award of Merit in 1927 and a First Class Certificate in 1933, when the late Mr. L. de Rothschild exhibited one of his fine Exbury forms. Forrest first found this species in 1917.

J. C. Williams, in his "Notes on the Lapponicum Group" (Rhod. Soc. Notes, II, 1920, p. 49) said of *R. scintillans*: "On the whole, if I had to begin again, and only to have one of these species, I should choose this, *i.e.* if I could raise plenty of it from seed. Most of the forms are good, but the best of the blue lavender forms are to me the best in the family, but not so the light coloured ones." In summing up he made the interesting remark, "I believe all of this series need cool, moist soil, and no shade, but in this part of the country to be on the side of a hill away from the sun. I have known great losses from their being dry and hot, but from no other cause, excepting when rabbits get to them. Rabbits take them as a personal offence."

R. impeditum (F. 5863 type), one of the 1910 collection, a compact little shrub with small, dark, shiny leaves and light blue, purple or lilac flowers, Cox considers to be "the neatest of all" and "the second best in the series". *R. fastigiatum* Franch., originally found by Delavay, a compact shrub with pale purple flowers, was collected by Forrest on the eastern flank of the Tali Range in 1906 at a height of 11–12,000 ft.

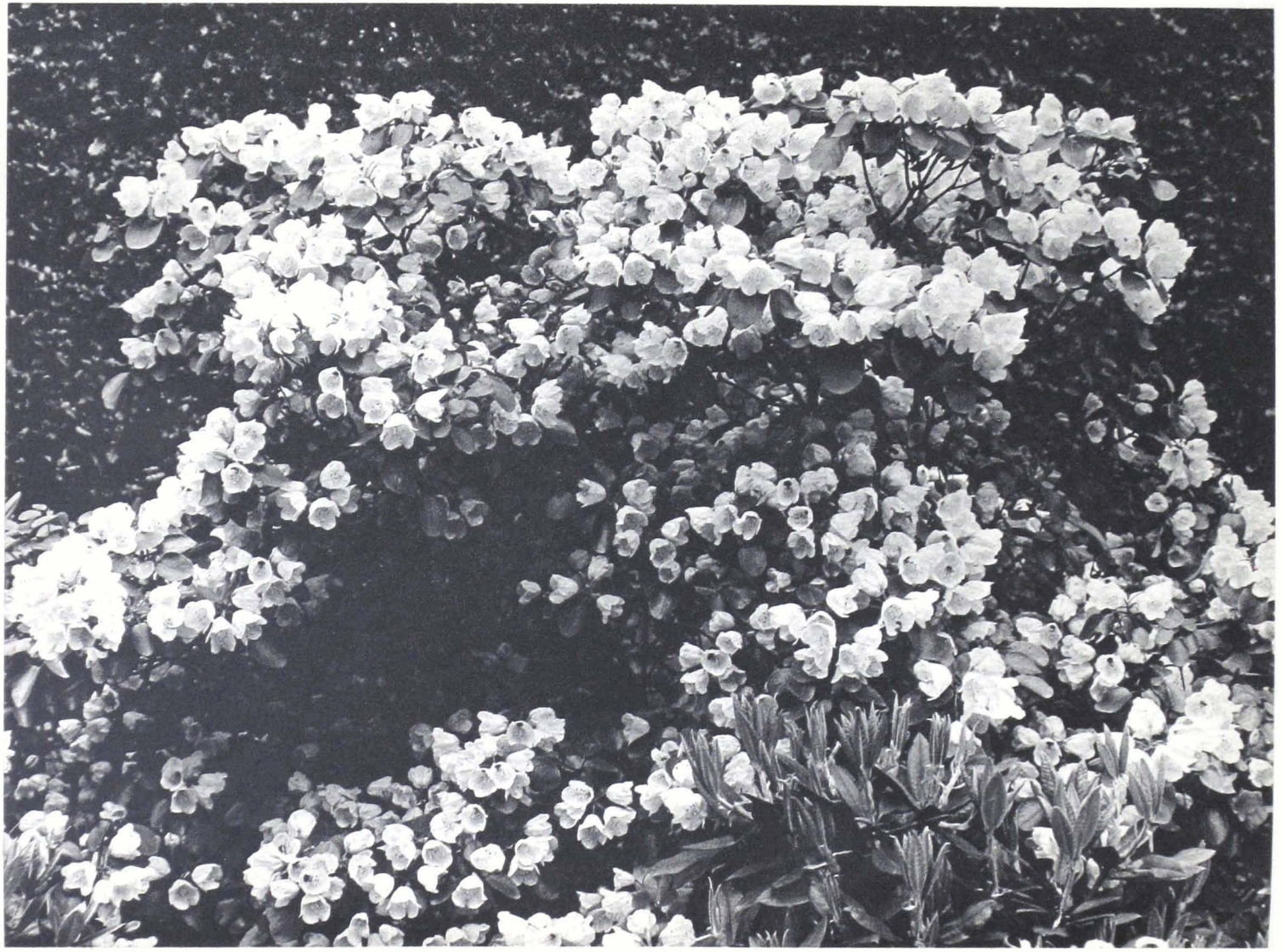
The well-known *R. hippophaeoides*, growing to a height of four or five feet, is taller than most other species in the series. Its silvery, glistening leaves, resembling those of the sea buckthorn (*Hippophae*), account for its name. It was found by Forrest in various parts of Yunnan in 1913.

No less than six of the eleven species of the Saluenense Series listed in *The Species of Rhododendron* we owe to Forrest; but he was not the first to discover *R. saluenense* itself, although he collected seed on several occasions. The photograph, by him, reproduced opposite, was obviously taken during or after a shower of rain, since the twigs, leaves and flowers are glistening with raindrops. Among the species which he did discover are two of the most prostrate, *R. prostratum* and *R. radicans*, which, never more than a few inches high, are unusual and outstanding rock garden plants. Both are very frost resistant, they flower freely, and the flowers, large for plants so lowly, are purplish-crimson. It has been said "there is no doubt that *R. prostratum* is one of the most distinct and beautiful of the dwarf species now in cultivation." *R. prostratum* (F. 5862 type), found "at the very edge of the precipitous snows", was introduced in 1910 and *R. radicans* (F. 19919 type) was introduced in 1921.

A dwarf species of the Boothii Series, which Bayley Balfour described as

RHODODENDRON
CALLIMORPHUM

Royal Botanic Garden,
Edinburgh



Photo, R. M. Adam

RHODODENDRON
RACEMOSUM
on the mountains
of W. China

Photo, G. Forrest

"one of the most charming of dwarf Rhododendrons", he named *R. megeratum* "lovely in the highest degree." This species, closely allied to *R. leucaspis*, has yellow flowers and the flower stalks are densely hairy. It comes from the mountain ranges between the Yangtze, Mekong and Salween Rivers, and was seen by Forrest for the first time on the Kari Pass in August 1914.

R. chrysodoron, "the golden gift", in the same series, is a taller plant which was raised from Forrest's seed (F. 25446) and named when flowering specimens were sent by the Earl of Stair to Edinburgh. It is akin to the variable *R. sulfureum*.

Again, among lepidote Rhododendrons with yellow flowers, note should be taken of *R. trichocladum* and the allied species of the series to which it gives its name. These are, for the most part, deciduous plants like the Azaleas, their counterpart among elipidote Rhododendrons. *R. trichocladum*, became known to us through Delavay's collections, but Forrest introduced it to British gardens. The most striking species of the series, however, is *R. lepidostylum* (F. 18143 type), which was found in open situation on cliffs at 11–11,500 ft. on the summit of Jangtzow Shan in W. Yunnan in 1919. Grown on a peaty bank or in a pocket of the rock garden, it forms a low mound. This is by no means a straggly plant like its closest allies, but the most attractive feature is the young foliage when it has just developed in spring. The fresh young leaves are of a beautiful, waxy, pale bluish-green. Unlike other species of the series, *R. lepidostylum* retains its leaves throughout the winter. The yellow flowers are few, but this is of no consequence since the beauty of the plant depends upon the foliage. The waxy bloom persists for the greater part of the summer, but later the leaves are green.

We are indebted further to Forrest for three species in the Glaucum Series, *R. shweliense* (F. 18151 type), a low aromatic shrub, with pale pink, yellow-tinged, spotted flowers; *R. micromeres*, (F. 21811 type), a bush, in nature usually epiphytic, which has creamy yellow flowers; and the anomalous *R. Genesterianum*, from N.E. Upper Burma, with plum coloured flowers, which unlike the other two is distinctly frost-tender.

Of the numerous dwarf species of the Anthopogon and Cephalanthum Series which Forrest introduced, *R. sphaeranthum* is a noteworthy example.

Mention may be made of *R. racemosum*, which although introduced into cultivation long before, was reintroduced by Forrest when collecting for A. K. Bulley in 1906. Most of the plants now to be seen in gardens have been raised from Forrest's seed. It is a very variable plant and, from a horticultural point of view, Forrest's dark red form (No. 19404) is by far the most attractive. Writing of *R. racemosum* in the *Gardeners' Chronicle* of 1910, Forrest states: "It holds almost the same position on the mountains of Western China as our Heather does at home, the masses of colour being visible for miles. The flowering of *R. racemosum* is practically continuous, extending from February to October or even later. The situation favoured by the plant is a dry and open locality, with a soil of reddish clayey loam,

Photo, G. Forrest

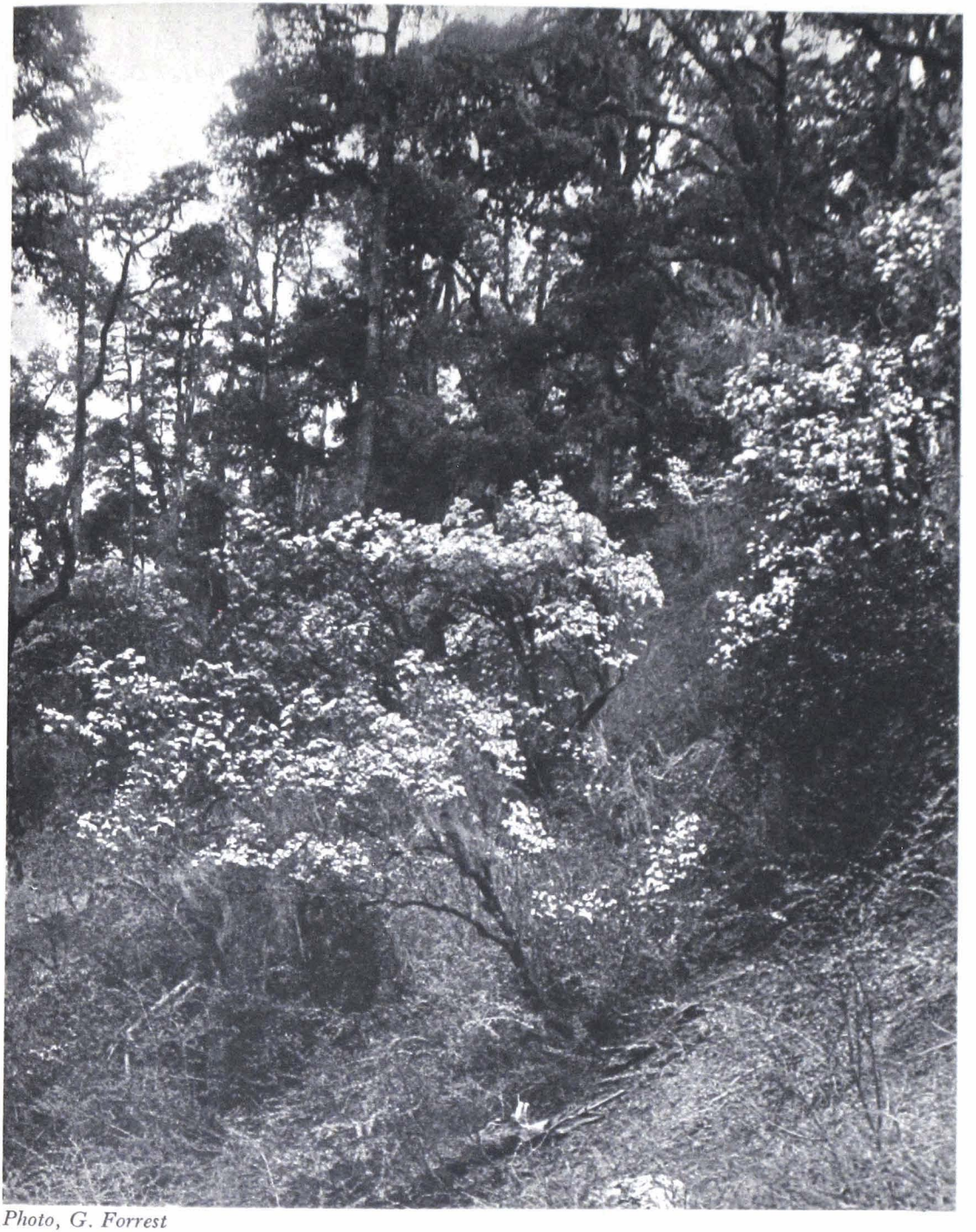
RHODODENDRON BULLATUM
on the eastern flank of the Tali Divide

containing a good admixture of lime, overlaying a pure limestone formation." Forrest's own photograph of *R. racemosum*, taken on the ascent of Sung-kwei from the Lankiung Valley is reproduced on page 59.

With regard to the Maddenii Series, *R. Taggianum* has already been described, but *R. Valentinianum* (F. 16011 type) cannot be omitted from this review. It is one of the few members of this series which can be grown successfully in the open at Edinburgh. It is a shrub only 2–3 ft. high, with bright, butter-yellow flowers, and although classed as "D" ("requiring shelter even in warm gardens inland") it has stood in full exposure.

On the contrary, *R. bullatum* of the Edgeworthii Series, also classed as "D", scarcely survives out of doors. It may be questioned whether *R. bullatum* and the Himalayan equivalent *R. Edgeworthii* are distinct, and doubtless, both in the Himalayas and in China, plants are sometimes terrestrial and sometimes epiphytic. Forrest, in a letter to J. C. Williams, remarked "I have little doubt but that the latter (*R. bullatum*) is the former (*R. Edgeworthii*) come to earth and thereby gaining on its ancestor in every point. I wonder, if one were to mix the seed of the two before sowing, if some of the experts who are so hot on the two species being distinct could, after a year or two, pick out the resulting seedlings. I very much doubt it." Although straggling in growth, *R. bullatum*, at its best, is very beautiful and deliciously fragrant. If it is mentioned that on the terrace at Bodnant it has been given a prominent place (and Lord Aberconway has chosen this) no more need be said of the merits of this plant. Photographs by Forrest, illustrating an article in the *Gardeners' Chronicle* (XLVI, 1909, p. 379) show *R. bullatum* in its natural home, on the eastern flank of the Tali Range in a gorge backed by snow-clad mountains. The photograph on page 61, also by him, was taken in the same locality.

Finally, in the Triflorum Series, the best known plant is perhaps *R. yunnanense*, which Forrest did not discover, although he frequently collected the seed, and a photograph taken by himself on the Li-chiang Range is reproduced opposite. *R. exquisitum* "is perhaps the gem of the series". Found by Forrest in S.W. Szechwan, it was described by Hutchinson, when plants raised from Forrest's seed (F. 20489 type) flowered at Exbury in 1932. The blooms, which are unspotted, "an exquisite pink", appear in May. This and the two species *R. artosquameum* (F. 14535 type) and *R. timeteum* (F. 16285 type) are very closely related. According to Hutchinson they differ in leaf shape and have more or less numerous scales. "And", he adds, "it is just such fine differences which have to be relied on to distinguish the closely related species of the group." A third species in the same complex, discovered at an earlier date by Forrest on the Li-chiang Range, was named *R. oreotrephes* (F. 5873 type). If there is, in fact, but one variable species the name *R. oreotrephes* must take precedence since it was published in 1906. A handsome plant, "of extreme beauty", it has flowers of deep rose-lavender, and the waxy bloom on the under sides of the leaves adds greatly to its attractions.



Photo, G. Forrest

RHODODENDRON YUNNANENSE
on the Li-chiang Range

Among those who during the present century have added to our knowledge of the flora of Upper Burma, Tibet and Western China, and who have greatly enriched our gardens by hundreds of plants from those regions, Forrest shares the honours with Wilson, Farrer, Rock and Ward. As far as the genus Rhododendron is concerned, however, it will readily be allowed by all who know his work and who enjoy his plants, that there he reigns supreme.

PRIMULA

Forrest's Primula collections rank second only to his Rhododendron gatherings, not only in actual bulk but in the number of species contained therein. In all he gleaned 154 species and subspecies. Many of these had been discovered previously by Delavay, who for nearly ten years, in every season, had botanised among the high mountains to the west, north and north-east of the great lake near Tali-fu in Yunnan; and it is not without significance that of the fourteen plates which illustrate this article, ten of them are of plants which Delavay was the first to record. That Forrest, carefully exploring this region which always must be associated with Delavay's name, should refind many of the French missionary's original discoveries was inevitable. But surely it is to his great credit that he found all the Delavayan plants save the two very rare Petiolares Primulas, *P. breviscapa* and *P. chartacea*. Inevitable too, no doubt, that neither Forrest, nor those working with his collections at home, should have realised to the full that many of his most beautiful gatherings were indeed of species which had fallen already to the hand of Delavay. For when Forrest began his work in China, Delavay's collections named by Franchet had not been distributed to British herbaria and the only available record of Delavay's work, beyond the types in Paris, was the published account of Franchet's new species; and descriptions of new species, as every taxonomist knows, frequently can be most misleading. Moreover it was not until Forrest had studied the genus for many years in the field, not only on the scene of Delavay's labours, but in other parts of Yunnan, and in Sikang, S.E. Tibet and Upper Burma as well, and had amassed copious material, that students of the genus began to realise the wide distributional nature and the remarkable plasticity of certain species. As a result many Forrestian gatherings, which have been given specific rank, have proved to be nothing more than geographical and ecological states of widespread species. It is for these reasons mostly (one does not forget the frailty of all things mortal, not even the frailty of the judgement of systematic botanists!) that of the 84 new species described from Forrest's material, 42 of them have had to be reduced to the limbo of synonymy.

To the horticulturist of course, the significance of any plant hunter lies not so much in the number of species new to science which he collects, but in the number of plants, new or old, which he brings to gardens. From this

Photo, G. Forrest

PRIMULA SERRATIFOLIA

point of view Forrest's record is particularly impressive. Whereas Delavay, the French Roman Catholic missionary, gathered seeds of but a few species, Forrest, the commercial plant hunter, financed by British garden syndicates and bringing business methods into the pursuit of plant collecting, harvested seeds of everything . . . "Primulas in profusion, seeds of some of them as much as 3–5 lbs." He it was who introduced to British gardens over 50 species of Primulas, including many of the glorious finds of Delavay. And although he believed that fully 70% of them would prove amenable to European culture, this estimate has proved to be too generous. Many of them, including some of the loveliest, made but a fleeting appearance and were gone, possibly for all time. But though many are taken from us, many remain, and of these, pride of place no doubt, must be given to the Candelabra species.

In the introduction of so many fine species of this alliance lies Forrest's greatest horticultural contributions to the genus Primula. *P. serratifolia*, located on the Tali Range in 1905, was induced to flower by Messrs. Bees in 1908; *P. Beesiana* and *P. Bulleyana*, both discovered in the moist mountain meadows of the Li-chiang Snow Range in 1906, the former with rose-carmine flowers, the latter with deep orange, were in culture from his seeds three years later; *P. helodoxa* from the streams, marshy meadows and clayey pasturelands of the volcanic region of Tengyueh and first gathered in 1912, was flowering in the garden of Messrs. Wallace of Colchester—even gaining the Award of Merit for them—in 1916; the blackish-purple flowered *P. anisodora*, one of his important finds on the Chungtien Plateau in 1913, also flowered for the first time in this country in 1916; *P. aurantiaca* of the moist alpine pastures of the Chiench'uan-Mekong Divide first displayed its deep reddish-orange flowers in our gardens in 1923, the year after its discovery; that is the story of Forrest's introduction of Candelabra species.

All are garden plants of the highest order and apart from *P. serratifolia* all are new species. After 1905, Forrest gathered the latter plant often—as did Rock, Ward, and Farrer—on the Li-chiang Range, in the Mekong-Salween Divide, in N.E. Upper Burma and in S.E. Tibet—areas far removed from the type locality on the Tali Range where Delavay first located it in 1884. With each yellow petal marked with a distinct bar of deep orange-yellow it is a striking species and over its wide area is remarkably consistent, except for the colouring of the petals. On the Burmese frontier, on the western flank of the Nmai Hka-Salween Divide north of Chimili, Forrest in 1925 met with two deviations from the norm. Both lacked the dark golden bar of the petals; in one (var. *unicolor*) the petals were a soft pale yellow and in the other (var. *roseotincta*) pale yellow and heavily suffused with purplish-rose.

Rock, Handel-Mazzetti and Schneider have extended the distribution of *P. anisodora* from Yunnan to Sikang. Though this plant thrives in a good moist loam and during the growing season may be treated as a bog plant, it dies after flowering—but usually produces abundant seeds. Whereas neither

Photo, G. Forrest

PRIMULA HELODOXA
in the volcanic region of Tengyueh

of these species is common in cultivation the others are well established plants, all having been gathered several times since the original finding, with corresponding reimportations of seeds. Moreover *P. aurantiaca* readily propagates by layering the apex of the flower scape. *P. Beesiana* and *P. Bulleyana* share many common features. Forrest maintained that there is no overlapping of the two as they grow on the Li-chiang Range. Both plants can be found in the same area, the former at a slightly lower elevation, though never in the same plant association. South of Li-chiang, in the Yungning and Yung-pei mountains, Forrest collected only *P. Beesiana*, although in this locality Rock took both species. Rock also located *P. Beesiana* in S. Sikang. Thus though there may be no common association of the two species, there certainly is an overlapping in the range of each. Moreover both appear to have the same ecological preferences, marsh mountain meadows and the sides of ditches and streams. Morphologically they are almost identical, and though in culture the flower colours have proved to be more or less stable, except in hybridisation, genetically they may be but definite colour strains of a morphologically uniform unit. They are the parents of 'P. x Asthore', seedlings of which, raised at Lissadell in 1914 gave a wide colour range from white to orange to orange-red, pink and salmon. With *P. Bulleyana* as the seed parent there is a dominance of yellow and orange in the flowers of the offspring. If *P. Beesiana* be the seed parent then there is a predominance of mauve, rose and pink shades.

The most elegant and beautiful of Forrest's Candelabra introductions is unquestionably *P. helodoxa* with the sturdy scapes rising to a height of 4 ft. or more, and carrying from 4–8 tiers of fragrant bright golden-yellow flowers, as many as twenty flowers to the umbel. Subsequent to 1912, Forrest refound the plant in Burma, on the Nmai Hka-Salween Divide, and in Burma it has also been collected by Kingdon Ward at Myitkyina, near the Feng-shui-ling Pass. So fine a plant as this well deserves the First Class Certificate which was awarded to it in 1921, but does not merit the contaminating influence of the pollen of *P. anisodora* or of any other species. The original *P.* x *anisodoxa* had dark chocolate flowers with a yellow eye and with traces of orange in the corolla-tube and towards the edge of the petals. But plants of the F_2 generation produced flowers of all shades of magenta with a preponderance of red.

These apart, Forrest collected flowering specimens and seeds of other species of this Candelabra alliance, previously discovered by others; *P. Poissonii*, picked by Delavay first in fruit in 1882 near Tali, and in flower the following year, on Mount Hee-chan-men, above Langkiung, was grown in Paris, at the Jardin des Plantes in 1890; *P. Wilsoni* the description of which was based partly on living plants raised from Wilson's seeds by the firm of Veitch and Sons; the two Kingdon Ward discoveries, *P. burmanica* in 1914 on the Burmese frontier, and *P. chungensis* in 1913, on the Sha-ka La in the Chung Valley in Yunnan, the latter gaining an Award of Garden Merit in 1933 and with *P. pulverulenta* forming the parentage of the fine

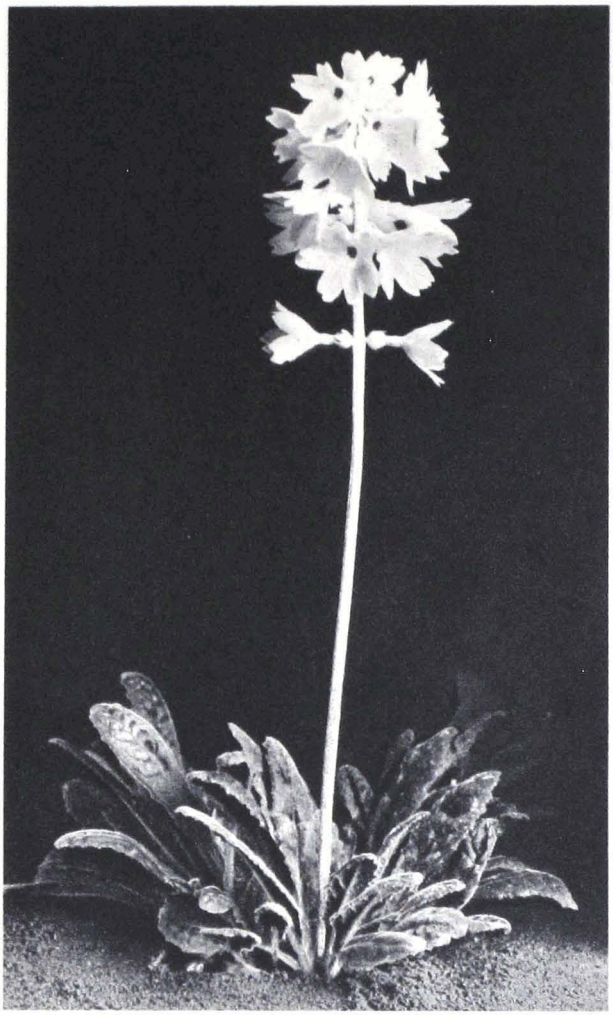
hybrid *P.* x *chunglenta*, which first flowered in 1929. *P. pulverulenta* is one of the outstanding garden plants of the Candelabra Section which Forrest did not collect; another is *P. Cockburniana*. Both have a somewhat restricted distribution, being confined apparently to the immediate vicinity of Tatsienlu in Sikang and both have been in European culture since 1905.

These Candelabra primroses stand pre-eminent in the genus by reason of their beauty, and their robustness and amenability to general European cultural conditions. Would that other species of equal or even greater charm had proved as accommodating. For instance, it must be admitted that with the Nivales species, many of which even as herbarium specimens are things of exquisite beauty, the horticultural world has had but limited success. As the record now stands, Forrest collected in all seventeen Nivalid Primulas. Ten of these are new species. Twelve others were also described as new but for the reasons already stated, must now be regarded as geographic or ecologic states of existing species. Of the seventeen, Forrest introduced eight of them as well as collecting seeds of many of the others. Some have been grown to the flowering stage, been duly figured, and died. Growing under moist conditions during the active period and enjoying a protracted and uninterrupted winter rest, as most of them do, they do not take kindly to our fluctuating cold season. Much the most successful of them has been *P. chionantha*, confined to the alpine meadows of the extreme N.W. corner of Yunnan, the Chungtien Plateau and its immediate vicinity, and there first encountered by Forrest in 1913. Four years later, plants from his seeds flowered in Kew and since this time this robust plant, carrying 1–4 umbels of flowers, usually white and fragrant, though occasionally tinged with blue, has always been with us, receiving the Award of Merit in 1921 and the Award of Garden Merit in 1924. Occasionally, in culture, there crops up in a batch of the usual white-flowered plants, individuals with dark purple flowers. This serves to emphasise the close kinship of Forrest's plant with the violet-purple flowered *P. sinopurpurea*, frequently observed by Forrest and introduced by him in 1911 but actually discovered by Delavay in 1883 in the Lankiung region of Yunnan. Though rather more obdurate in culture than *P. chionantha* it still persists in gardens. In their vegetative characters and in their inflorescences, including the fruit, no valid distinctions are discernible between these two plants. Moreover, geographically no line can be drawn between them, for *P. sinopurpurea* is widely distributed in Sikang, across the Tibetan frontier as far as the area lying behind E. Bhutan, and is very common in the mountain ranges of W. Yunnan, where Forrest also found it on the Chungtien Plateau. Though horticulturally these plants are regarded as separate entities, *P. chionantha* may well be no more than a white-flowered variety of the other. Likewise another Forrest introduction *P. sinoplantaginea*, always rare in gardens, may be merely a dwarf narrow-leaved edition of *P. sinopurpurea* and frequently it is difficult to separate one from the other. Their distribution is almost similar, for *P. sinoplantaginea* in Sikang ranges northwards of Tatsienlu and in

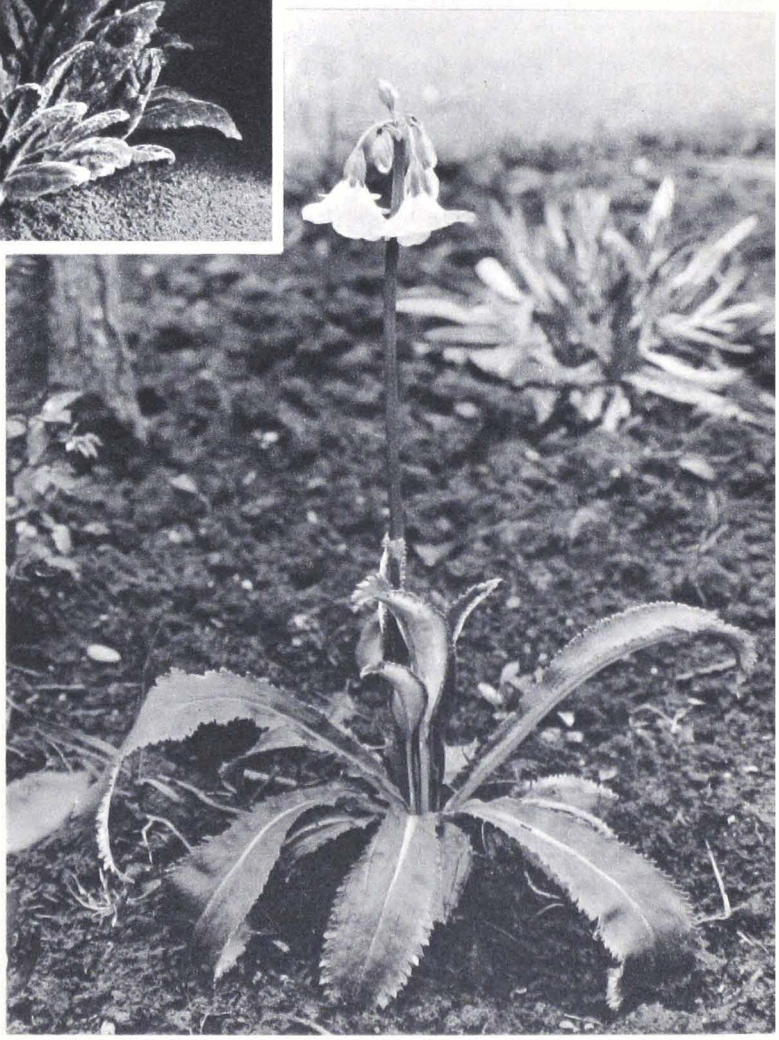
Yunnan is restricted to the N.W. corner and to the adjoining Tibetan frontier. Though Balfour chose for his type a Forrest specimen taken on the Bei-ma-shan in 1918, *P. sinoplantaginea* was actually first found by Ward in 1911 at Atuntze. Two other introductions which are also closely allied to each other are *P. aemula* and *P. szechuanica*, both with pale yellow flowers, the former discovered by Forrest in the mountain pastures of the Chung-tien Plateau in 1913 and introduced by him in 1916, the latter first observed by Pratt, near Tatsienlu in 1889–90 and introduced by Wilson in 1906. The corolla lobes of *P. szechuanica* are completely reflexed and lie against the tube; those of more robust *P. aemula* are more or less patent and only occasionally slightly reflex. These distinctions may not be of great moment but they are evident in the cultivated plants as well as in the herbarium specimens. *P. szechuanica* is a more northerly plant, very common in Sikang, and as far as the evidence goes only to be found in Yunnan on the Chung-tien Plateau. *P. aemula* on the other hand only invades the territory of its ally in one corner of S.W. Sikang. Since their original introduction they have been intermittently in culture but always have been rare.

The rest of Forrest's Nivales introductions have had an even more transient history. *P. limbata*, very striking by reason of the prominent marginal rim of white farina on the obovate leaves, found by Forrest in 1917 on the Mekong-Salween Divide in the extreme N.W. corner of Yunnan where that province meets Sikang and Tibet, showed its purplish-blue grey-eyed flowers for one season in the rock garden at Edinburgh in 1924, but did not survive. *P. calliantha*, deep purplish-violet or soft purplish-rose in the corolla, another of Delavay's Tali finds of 1883 but gathered since by Forrest, Rock, Farrer, Ward, Ludlow, Sherriff and Taylor, though abundant locally, is not widespread in the mountains of W. Yunnan and apart from the Tali Range occurs chiefly in the N.W. corner of the province with extensions into the adjoining part of S.E. Tibet and Upper Burma. It has also been recorded from that part of Tibet which lies behind E. Bhutan. Though seedlings raised by Bees in 1908 from Forrest's seed did not develop beyond that stage, plants were induced to flower in Edinburgh in 1925–26 from reimportation of his seeds. From that time forth it was not again seen in gardens until a year or two ago. Then Ludlow and Sherriff sent home by air mail beautiful resting-buds on which perhaps greater fortune will attend.

With the truly magnificent *P. Agleniana*, the coarsely serrate to almost laciniate-dentate leaves almost a foot in length, and the scape up to 18 in. high carrying 3–8 fragrant flowers at least an inch in diameter, it is much the same story. Fleeing from the hostile Tibetans in 1905, Forrest secured from the Mekong-Salween Divide, a solitary inflorescence which remained unidentified until 1919 when he found his plant again, this time in S.E. Tibet on the Salween-Kiu-chiang Divide. With further records from N. Burma and the Assam Himalaya, the distribution of *P. Agleniana* has been shown to be fairly wide, and over the area, the range of flower colour quite



PRIMULA SPICATA
at the Royal Botanic
Garden, Edinburgh



PRIMULA
AGLENIANA

Photos, R. M. Adam

extensive. Normally pale yellow, the corolla may be deep gamboge (var. *atrocrocea*), rosy-pink (var. *thearosa*) or ivory white (var. *alba*). Of the latter variation Forrest wrote, simply "white, faintly flushed rose exterior"; and Farrer, under his 1712, "Flowers externally pure ivory-white, occasionally flushed very faintly with rose antique and with a touch of rose or apricot on the tube, as it emerges from the maroon-crimson calyx lobes; internally with the dimmest suffusion of yellow". Forrest sent home abundant seeds, but most sowings were without result. However, the late Mr. J. C. Williams of Caerhays scattered some seeds in Cornwall broadcast near beeches and the resultant plants flowered in 1927; but as usual they did not persist. Neither did the solitary plant of the variety *alba* which bloomed for one or two seasons in the Edinburgh rock garden. It died without offspring.

Many would vote *P. Agleniana* the loveliest species in the genus. Not so Forrest. "Here . . . on the dry rocky slopes, growing amongst limy grit at the base of the cliffs, is the most beautiful species, in my opinion, of all known Primulas. None can compare with this species in airy gracefulness or in rich colouring, the azure blue flowers forming a wonderful contrast to the silvery farina with which the plant is coated. The scapes are so slender that they seem scarce able to bear the weight of the relatively large flowers, which the slightest current of air sets trembling and swaying, much in the manner of some of the Campanulas." Thus he wrote in 1916 (Journ. Roy. Hort. Soc. XLI, 203) of *P. spicata* as he knew it on the mountains around Tali, where Delavay had found it in 1884 and where apparently it is endemic. From 1906 onwards Forrest sought the plant on various occasions and more than once harvested seeds. Mr. A. K. Bulley, for whom Forrest was collecting, brought plants into cultivation in 1908 but only for a short time. Plants from a second consignment of seeds were flowered in 1918 by Messrs. Wallace of Colchester and these gained the Award of Merit. It is one of these latter plants which forms the subject of Plate 8821 of the *Botanical Magazine* and which like the present photograph gives little idea of the fragile beauty of native specimens. There is no difficulty in raising plants from mature seeds; the trouble is that such plants die after flowering without ripening their capsules. The only other Soldanelloid species to figure in Forrest's herbarium is the better known *P. nutans* gleaned by Delavay in the same year as *P. spicata* in the pine forests and rocky pastures of the plateau of Mao-kou-tchong, between Langkiung and Hoking. Forrestian specimens from 1904 onwards show that it has a wide though not a continuous distribution on the ranges of W. Yunnan. It has also been recorded from within the borders of S.W. Sikang, as well as, rather unexpectedly, from eastern Yunnan. In 1916 Mr. J. C. Williams flowered plants raised from Forrest's 1914 seeds and thus this fine horticulturist was the first to see in culture the now familiar compact spikes of beautiful lavender-blue or violet flowers, lightly powdered with farina. *P. nutans* is the most amenable species of its section and in favourable seasons sets seed in the open. It is, however, monocarpic.

PRIMULA NUTANS

Photo, D. Wilkie

PRIMULA
VIALI
in the Wild

Photo, G. Forrest

Also regarded as monocarpic is the Kniphofia-like *P. Viali*, better known horticulturally as *P. Littoniana*, and one of the most remarkable species Forrest introduced. He wrote of it . . . "a superb species . . . with flowers in densely crowded spikes 2–3 in. in length each bearing hundreds of small deflexed fragrant blooms of deep purplish-blue; but the remarkable feature is the magnificent colouring of the calyces which are a vivid scarlet-crimson and form a striking contrast to the rich blue of the expanded flowers. Plants grow in crowded masses, generally in moist grassy openings in pine-forests at an elevation of 10–11,000 ft." Delavay, finding it at Langkiung in 1888, recognised it as something quite new and attached to his specimens the MS. name of *P. Viali* (thus commemorating the name of his colleague Père Vial) before sending them to Paris. When Forrest rediscovered the plant in 1906, he had for consultation Pax's Primula monograph published the year previously. He was unable to identify his plant with any species in the monograph, and though he thought it strange that so conspicuous a member of the Yunnan flora should be undescribed, the evidence seemed conclusive and he named the plant after his friend and companion Consul Litton. Forrest was not to know then, as we know now, that the *P. Viali* of Pax's monograph is a chimaera involving four species, the true *P. Viali*, *P. gracilenta*, *P. Watsoni* and *P. deflexa*, all of which he gathered during the course of his travels. *P. Viali* must be regarded as being well established in European gardens. As it rarely flowers until its second season of growth and then is prone to perish, it is usually treated as a biennial. But there are records of its permanent establishment in large groups which renew themselves by self seeding.

P. gracilenta agrees with *P. Viali* but differs from all other members of the section Muscarioides in having the lobes of its deep bluish-purple corollas markedly acute. Pratt found it first in W. Sikang and on the Tibetan frontier in 1889. Not until 1913 did Forrest see it and then in Yunnan, on the Li-chiang Range. Seeds of F. 11352 germinated and the resulting plants flowered in Edinburgh in 1915. The species was soon lost, however, but was reintroduced in 1932 by the Marquess of Headfort who raised it from seeds of F. 28529. *P. deflexa*, the flowers markedly deflexed and dark blue or rose-purple or white, is one of Wilson's discoveries and introductions from western China. Forrest collected it in Yunnan on the Chungtien Plateau in 1914 (though these specimens were regarded as representing a new species and were described as such under the name of *P. conica*) and subsequently in Sikang in the mountains around Muli. Its close ally *P. Watsoni*, with corollas of deep indigo-purple and with remarkably short lobes, hails from Tatsienlu where it was seen by Mr. C. M. Watson in 1889. Seeds gathered by Watson in 1908 gave flowering plants in 1911, six years before Forrest met with it and harvested seeds, on Ka-gwr-pu,[1] on the Mekong-Salween Divide of S.E. Tibet.

[1] Editor's Note. This is probably the mountain group now known as Khakarpo.

Still within the Muscarioides alliance *P. cernua* and *P. pinnatifida* are both discoveries of Abbé Delavay. The former, well characterised by the obovate subentire often subsessile leaves and by the widespread limb of the corolla, he found near Tali in 1883. Apart from a second Delavay gathering three years later, nothing more was heard of the plant until Forrest rediscovered it on the Hoking-Langkiung dividing range in 1910 and in subsequent years extended its range from Yunnan into S.W. Sikang. From his seeds *P. cernua* was flowering in British gardens in 1918 and ten years later it received the Award of Merit when exhibited by Mr. C. T. Musgrave. It was, however, always a rare plant and at this date is most probably lost. *P. pinnatifida*, however, introduced from Forrest's seeds by Bees Ltd. in 1908, and likewise a rarity, still is in culture, though not necessarily from Forrest's seeds of course. Usually quite distinct because of the deep cutting of the leaves, Forrest saw it in 1906 in Delavay's type locality of 1884 on the Li-chiang Range. Subsequently he collected it often, on nearly all the main ranges of W. Yunnan and extended its range into Sikang.

A few gatherings which he made in the Chiench'uan-Mekong Divide, gatherings with rather deeply cut foliage but far too robust to represent *P. pinnatifida*, Forrest regarded as cut-leaved forms of *P. muscarioides*, a fine sturdy species with fragrant deep purplish-blue flowers, inhabiting the moist alpine meadows of S.E. Tibet, Yunnan and Sikang. Seeds which Forrest collected in 1905 were forwarded to Bees Ltd. One of the resulting plants, sent to Kew in 1907, formed the basis of Hemsley's diagnosis in the *Kew Bulletin* and also the text and the figure of the *Botanical Magazine* article of that year. Closely akin to Hemsley's species is Forrest's one other addition to this section, *P. apoclita*, a denizen of the wet stony alpine pastures of S.E. Tibet, S.W. Sikang and Yunnan. Compared to *P. muscarioides* it is much less robust with smaller more hairy matt foliage and with a shorter flower scape always markedly farinose towards the apex. Forrest first encountered it, along with *P. Watsoni*, on Mount Ka-gwr-pu in the Mekong-Salween Divide in 1917. Material with smaller somewhat less indented leaves, taken the following year on the mountains N.E. of the Chungtien Plateau was described under the name of *P. lepta*. But since that time the rich material from S.E. Tibet and S.W. Sikang has shown convincingly that Forrest's Yunnan plant cannot now be upheld as a distinct species. *P. apoclita* has been in some gardens, somewhat intermittently, since it was first grown from seeds of Forrest 19522 in 1924.

Also on the Ka-gwr-pu in 1917, and on the same day of July in fact that he found *P. apoclita*, Forrest met with a dwarf evergreen primrose forming cushions up to a foot in diameter and starred with deep carmine-rose flowers. Recognising it as of the kinship of *P. dryadifolia* but as something quite new, he and Balfour named it *P. mystrophylla* thus calling attention to the spoon-shaped leaves which are less than an inch in length. Though Forrest secured seeds the following year there is no record of any success in culture. With *P. dryadifolia* itself, so aptly compared by Franchet with *Dryas octo-*

PRIMULA
DRYADIFOLIA

Photo, G. Forrest

petala, the horticultural story is a little less depressing. Plants even showed their large fragrant rose-pink blossoms in 1914, in Edinburgh and elsewhere, from seeds chiefly obtained by Forrest; but not attaining the stout rhizomic development and the spreading woody habit so characteristic of their native haunts—the wet limestone screes close to the limit of perpetual snow, at elevations of from 15–16,500 ft.—they were short lived. Over its wide area in Yunnan, Sikang, S.E. Tibet, Burma and the Burma-Tibet frontier, it has colonised not only limestone but also gneiss and granite, and exhibits great variation in growth form. Some such forms which are but responses to transitory conditions in the environment have in the past been given specific rank—*P. chrysophylla*, with vivid yellow farina, *P. cycliophylla*, with small orbicular leaves, and *P. congestifolia*, the leaves forming dense mats. All these names must be regarded as synonymous with *P. dryadifolia*. Quite distinct, however, is the yellow flowered *P. chlorodryas* known only from the Fu-ch'uan Range which lies to the S.W. of Weisi in the Mekong-Salween Divide where it was discovered by Rock in 1928. Lord Aberconway was able to exhibit flowering specimens at The Royal Horticultural Society in 1934, and in this same year, raised from seeds collected both by Forrest and by Rock, the species bloomed in several British gardens. But at this date apparently it does not survive anywhere. *P. triloba* is likewise distinct, and yet obviously akin. It is very dwarf and caespitose, with the leaves three-lobed and the petals a beautiful rose. Forrest encountered it in 1918 at elevations of over 16,000 ft. in the peaty pastures, and on the screes and the cliff ledges of the Londre Shan, that part of S.E. Tibet which touches on the extreme N.W. corner of Yunnan.

The original diagnosis of *P. triloba* associated it with *P. bella*. But though the corolla-throat of *P. triloba* is pilose it is not occluded with a distinct pompon of hairs such as is so characteristic of the plant Delavay found in 1884 at an elevation of 13,500 ft. on the summit of Tsang-shan in the range of mountains immediately above the town of Tali. Numerous gatherings since then have shown *P. bella* to be abundant on many of the ranges of W. Yunnan and S.W. Sikang, when in its typical form it occurs in matted formations, the deeply incised leaves, no more than half an inch long, forming tight rosettes from which arise slender often flexuous scapes, carrying usually solitary violet-purple or rose salver-shaped flowers. Forrest gathered seeds in 1908; they germinated readily enough and plants flowered in Edinburgh in 1910. Though the species remained with us for some years due almost entirely to further sendings of Yunnan seed, it appears to have been lost long ago. Something like *P. bella* occurs not only on the ranges of W. Yunnan but also in the extreme north-west of that province, in S.W. Sikang, in the Tibetan province of Tsarong and in N. Burma. Plants from such western ranges as the Li-chiang are in reasonable conformity with those from the Tali Range. Those from more outlying ranges however show a degree of deviation from the type plant and have been described as distinct species. One such is *P. Bonatiana*, collected

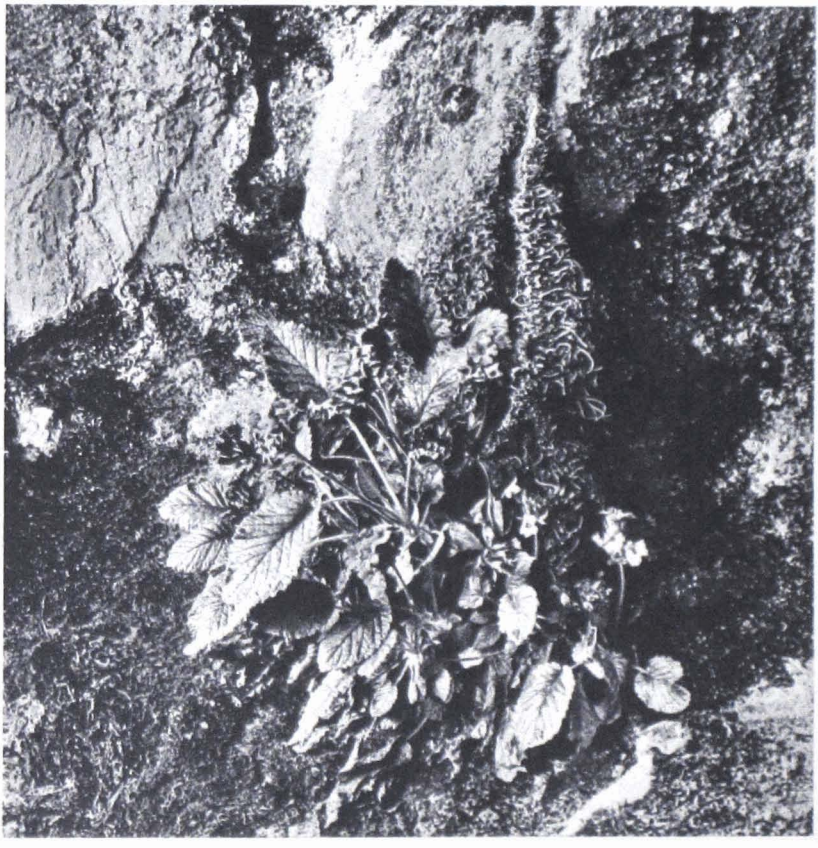
on Mt. Sila in the region of the Upper Mekong, by Soulié in 1895. Two others, *P. coryphaea* and *P. sciophylla*, are plants of Upper Burma, first taken by Ward in 1914 from the Nmai Hka Divide. In 1914, Handel-Mazzetti obtained still another, *P. cyclostegia*, from the Chungtien Plateau. Forrest gathered all of them, as well as *P. nonobella*, one of his Li-chiang Range discoveries of 1906. They are all within the aggregate of *P. bella* and perhaps are best regarded as subspecies of Delavay's plant.

These dwarf evergreen cushion plants with their woody rhizomes clothed with withered leaves, recall in some ways the Bullatae Primulas, species characterised by their remarkable suffruticose and compact cushion habit, thick woody stems and the slow decay of their bullate leaves. It is a small group of 7 species and during the course of his explorations Forrest gleaned 6 of them. One, the small *P. Rockii* with its incised-lobulate broadly ovate cordate leaves and yellow notched or crenate petals, he saw only on his last expedition. It is confined to the mountains of K'u-lu and of Muli in S.W. Sikang where Dr. Rock discovered it in 1928. From Rock's seeds the species was induced to flower in British gardens in 1935 when it gained the Award of Merit. Of two of the others, *P. bullata* and *P. Henrici* there is no genuine cultural record. The former, carrying from 6–20 rich deep yellow flowers on stems ½–8 in. in height, Forrest saw but once, at Hoking in 1913, and thus not far from Mt. Hee-chan-men near the Lankiung-Hoking Divide about halfway between Tali and Li-chiang—Delavay's type locality of 1884. A later Delavay gathering on Hee-chan-men, Balfour described as a new species under the name of *P. rufa*. At best this is but a rufous-hairy variety of Franchet's plant; it has been reported as being in cultivation, but all such references to it should be referred to *P. Forrestii*. *P. Henrici*, its scape almost obsolete or at most an inch long, always hidden among the foliage and carrying either a single flower or a 2–6-flowered umbel, with the petals yellow or white, or white flushed with rose or magenta, was gathered by Prince Henri d'Orleans somewhere between Lhasa and Batang in 1890. Forrest's solitary specimen of it from the Salween-Kiu-chiang Divide of S.E. Tibet in 1919 was deemed to be a new species and was named *P. tapeiana*. From the limestone crags near Mo-so-yu in the Lankiung area of N.W. Yunnan, Delavay collected *P. bracteata* in March 1883. Specimens of it, picked by Ward thirty years later, as well as flowering plants cultivated by Bees Ltd. and in Edinburgh in 1915 from Ward's seeds, were named *P. pulvinata*. Likewise Forrestian gatherings of the plant on the Chiench'uan-Mekong Divide, on the Li-chiang Range and in the mountains N.E. of Muli, Forrest believed to represent some form of *P. Dubernardiana*, the beautiful plant which forms great round cushions studded with yellow-eyed rose flowers, and which commemorates the name of Forrest's martyred companion and friend, Père Dubernard of the Roman Catholic French Mission at Tseku, the little town in the valley of the Mekong in N.W. Yunnan, in the vicinity of which Forrest collected the type specimen in 1904. One sending of his

PRIMULA
FORRESTII
in the Royal
Botanic Garden,
Edinburgh

Photo, D. Wilkie

PRIMULA
FORRESTII
showing habit of
species and long
woody rootstock
on the
Li-chiang Range



Photo, G. Forrest

seeds, harvested in 1917, gave rise to flowering plants in 1919 and these, to the plate in the *Botanical Magazine* (t. 9266) for 1931.

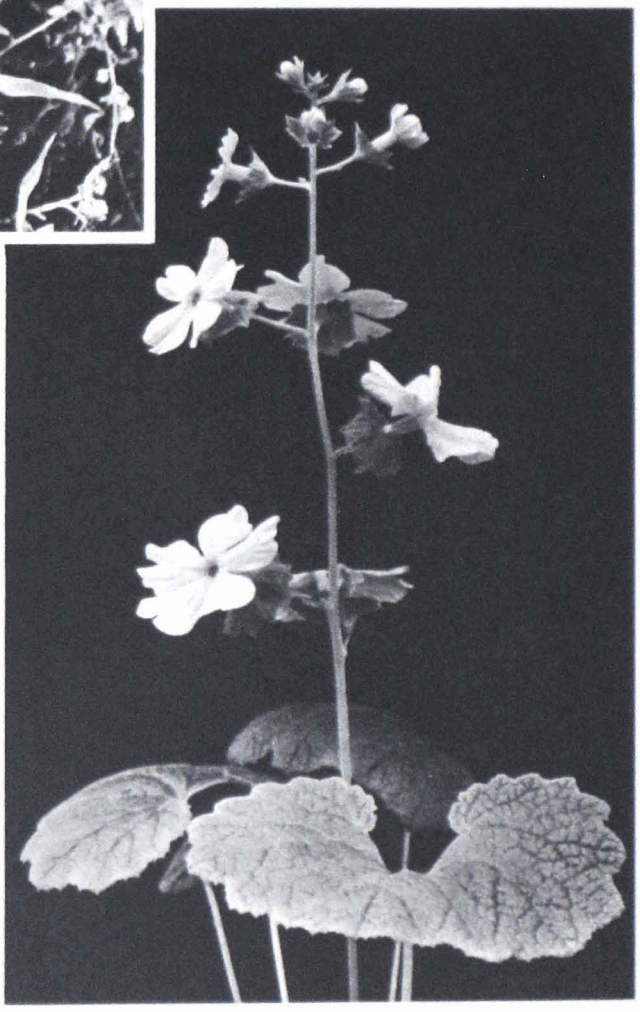
In the same way the *Botanical Magazine* plate of *P. Forrestii* (t. 8313) was drawn from plants which flowered for the first time in Britain in 1909, grown from seeds harvested by Forrest in 1906, the year he discovered this most horticulturally accommodating species of the section in the dry shady crevices of the limestone cliffs of the Li-chiang Range. Let the discoverer speak for this species himself.

"The plant is specially adapted to the situation in which it is commonly found, i.e. the crevices of dry shady limestone cliffs, in having a long extremely tough woody rootstock of 2–3 ft. in length. The base of the rootstock is very tapered, generally only a few inches being enclosed in the crevices of the rocks. From this point of view the plant is pendulous for almost the full length of the remainder of the rootstock, a few inches of the growing apex being turned out and upwards. The rootstock for two-thirds of its length, is covered with the induviae of previous years' foliage, which at the apex forms a dense matted mass, with the fresh foliage and flowers arising from the centre. Judging from the length of the rootstocks of specimens seen growing, allowing two whorls of leaves for one year's growth—a liberal estimate—some plants must reach the age of 50–100 years. Another feature which pointed to the great age in the species was that the cliffs behind some of the larger specimens were scored and worn to the depth of fully an inch by the motion of the plants in the wind."

Although the centre of distribution of *P. Forrestii* is the Li-chiang Range, it is also found to the west in the Lankiung-Hoking area, where Delavay collected not only *P. bullata* and the plant Balfour described as *P. rufa*, but a species of quite a different alliance with large spreading foliaceous calycine segments—*P. malvacea*. Delavay made his type collection in 1883. When Forrest picked the plant in 1906 on the divide between the Hoking and Lankiung Valleys and thus near the type locality, he named them *P. langkongensis*, but realised when once he saw specimens in culture in 1908 from his seed, that his plant was none other than Franchet's *P. malvacea*, which from the midst of soft rounded long stalked leaves sends up tall scapes bearing whorls of pale rose flowers. The handsome and closely allied *P. blattariformis*, also with rosy flowers of pale or dark shades, usually not in whorls but in a more or less secund raceme, and with a basal rosette of hairy oblong to obovate leaves, is another plant in the discovery of which Forrest was forestalled by Delavay, who collected it in 1885 on the limestone pastures of Che-tcho-tze near Tapin-tze to the north-east of Tali. Not until 1913 did Forrest locate it and then in the Lankiung Gorge, and from the seeds he gathered it was introduced to British gardens. Its area of distribution is confined to N.W. Yunnan and to an area around Muli, and sometimes it grows in the company of *P. malvacea*. To Forrest also falls the credit of introducing the third outstanding plant of this alliance, the yellow-flowered reniform-leaved *P.*

PRIMULA
BLATTARIFORMIS

Photo, G. Forrest



PRIMULA
BATHANGENSIS

Photo, D. Wilkie

bathangensis, seeds of which he procured, also in 1913, from the mountains N.E. of the Yangtze Bend, as well as on at least six subsequent occasions. Forrest of course did not discover this species; honour for this goes to the French missionary Soulié in 1889–90; and Batang in W. Sikang near the Tibetan frontier is the type locality.

Père Soulié's name was commemorated by Franchet when the French botanist described *P. Souliei* (afterwards made the type species of the section of this name by Balfour) from specimens which the missionary collected on the mountains of Tchito near Tatsienlu where he was stationed between 1886 and 1891. Though Forrest never found Soulié's plant he did gather two species of close kinship. One of them was new to science, *P. rupicola*, a plant of the cliffs, boulders and stony pastures of the mountains in the north-west corner of Yunnan, with oblong-lanceolate or spathulate yellow farinose scabrid leaves and with umbels of 2–8 rose flowers. Discovered in 1913, it flowered in cultivation in 1921, the year before Forrest made collections of a white farinose form of it in S.W. Sikang. The other species, the purplish-rose-flowered *P. incisa*, dates as far back as 1869, when, in the alpine woods in the district of Mupin, north-east of Tatsienlu, it was seen by the distinguished naturalist Père Armand David. It is a fairly prevalent plant in W. Sikang and extends also into N.W. and N.E. Yunnan and has an altitudinal range of 10,500–15,000 ft. In the degree of incision of the leaves *P. incisa* is most variable. Forrest's first collections of it from the Yangtze Bend in 1913 were named *P. florida* and under this name it was flowered in Edinburgh from his seeds in 1913 and figured in the *Botanical Magazine* in 1938.

These Souliei Primulas find their nearest affinity among the great group of Farinosae species, which from a horticultural standpoint must be termed somewhat difficult subjects. One which is fairly familiar in cultivation, having been introduced by Forrest in 1916, under the name *P. chrysopa*, is actually a Soulié discovery. For Forrest's specimens of *P. chrysopa* from the Bei-ma-shan are identical with those taken by Soulié on the Zamba La near Batang in 1904, which were named *P. zambalensis*. It is but a southern expression of the Kansu *P. gemmifera*, differing in the stouter habit, fleshier leaves and larger pinkish-purple corollas. On the other hand specimens of Soulié 879 from Tongolo in 1893, which in Paris were named incorrectly *P. tibetica*, and which were described by Balfour as *P. Reginella* in 1916, are actually *P. fasciculata*, recorded by Ward in 1913 from the bogs of the Chungtien Plateau and brought into cultivation by Forrest, whose seeds taken from near the type locality in 1917–18, gave rise to flowering plants in Edinburgh in 1919. It has a range from Yunnan through Sikang to Kansu and the adjoining Tibetan frontiers, and may have solitary bright pink flowers or a 2–6-flowered scape. Of close kinship with *P. fasciculata* is the peculiar *P. oxygraphidifolia*, its 1–2 in. high scapes, bearing a solitary mauve pale yellow-eyed flower, rising from a tuft of rather fleshy distinctly stalked ovate or suborbicular leaves at most an inch in length. Both Ward

PRIMULA PULCHELLA
in the Wild

Photo, G. Forrest

and Forrest found it in the Muli Mountains in 1921, the former in June, the latter in July. They alone have seen it apparently and neither obtained seeds.

As the members of the Farinosae section are now interpreted Forrest enlarged the group by two valid species only. On the Yang-tsa Shan, in the Mekong-Salween Divide in 1921, he found *P. caldaria*, markedly stoloniferous and with small white flowers. His second new addition was known in culture before adequate native material was collected. Plants grown by Bees Ltd. from Forrest's seeds in 1908, were named *P. umbrella* in 1913 and the diagnosis of 1915 was based on a cultivated specimen flowering in Edinburgh. Not until 1919 did Forrest meet with satisfactory native specimens; and then strangely enough, those which he did pick from the dry cliff ledges of the Nmai Hka-Salween Divide, were not correlated with *P. umbrella* but were described as *P. maikhaensis*. Forrest relates that he collected *P. umbrella* along with *P. membranifolia*, a beautiful dwarf but frail plant no more than two inches high with an umbel of 1–9 large violet-rose yellow-eyed flowers, which Delavay culled from Mt. Tsang-shan near Tali in 1883. Bees again, from Forrest's seeds brought it into culture in 1908, but the plants which flowered four years later and which were exhibited at The Royal Horticultural Society did not set seed and were quickly lost.

Both *P. umbrella* and *P. membranifolia* are close kinsmen of still another Delavay discovery, this time from the limestone rocks near the base of the main Li-chiang glacier, the elegant *P. yunnanensis*. Not uncommon at elevations of from 10–17,000 ft. in N.W. Yunnan, especially in the heights around Tali and Li-chiang, and extending just over the frontiers of S.W. Sikang and S.E. Tibet, it was another of the 1908 introductions of Bees from Forrest's seeds harvested on the Tali Range two years previously. Bees Ltd. were also the introducers of both *P. pulchella* and *P. pulchelloides*. The former, a very beautiful perennial with lanceolate or oblanceolate somewhat fleshy leaves up to eight inches long and covered below with yellow farina, and with scapes up to a foot tall carrying an umbel of as many as thirty pale lavender to deep purplish-blue flowers, is a denizen of the alpine meadows of the limestone country near Tapin-tze in Yunnan where Delavay met with it in 1884. It is fairly common at altitudes ranging from 6–15,000 ft. in N.W. Yunnan and S.W. Sikang. From seeds harvested in the Tali Range in 1906, Forrest brought it into European culture in 1908 and from that time until a few years ago it was intermittently in gardens. *P. pulchelloides*, resembling a dwarfed condition of *P. pulchella*, with very narrow leaves and few flowers to the umbel, Ward found in 1911 near Atuntze in the extreme N.W. corner of Yunnan. From Ward's seeds Bees flowered the plant in 1912. Of the same affinity as these 2 species, *P. Prattii* is nevertheless quite distinct by virtue of its bright soft yellow petals with a pentagonal orange blotch around the eye. Known only from Sikang where Pratt discovered it near Tatsienlu in 1890 and where both Forrest and Rock have repeatedly found it in the Muli Mountains,

Photo, G. Forrest

PRIMULA SECUNDIFLORA

plants were induced to flower in Britain in 1920 (the seeds were Forrest's). Though *P. Prattii* remained in culture for some years, it was lost long ago. But another species of which Pratt was also the first collector —in 1890 and again from near Tatsienlu—still is in cultivation, and has been so for almost fifty years, the familiar pink or white flowered *P. yargongensis*. Messrs. Veitch raised the first flowering specimens in this country, though under the name of *P. sibirica* var. *chinensis*, from seeds collected by Wilson in 1903. Either under its valid name, or as *P. Wardii*, which is merely a synonym and the name given to Forrest's 1913–14 collections from the Yangtze Bend, it is one of the most amenable of its section, producing seeds fairly freely.

The firm of Veitch and their collector Wilson must also be credited with the introduction to this country in 1905 (when it gained the Award of Merit) of the beautiful *P. secundiflora*, likewise an amenable freely seeding species, and, with its sturdy tall scapes carrying a terminal umbel of as many as twenty nodding purple or deep rose-red flowers the calyces of which are streaked with five conspicuous white farinose lines, another of the outstanding discoveries of Delavay from near the glaciers of the Li-chiang Range in 1884. Since that time it has been collected on numerous occasions and by various collectors in N.W. Yunnan and in Sikang, Forrest's first finding of it being in 1906 on the Li-chiang Range. These ample gatherings show conclusively that its distribution is continuous and that no valid distinctions can be drawn between it and *P. vittata*, described from material obtained by Prince Henri d'Orleans from the moist meadow lands between Batang and Litang. Similarly there are no significant differences between *P. firmipes* and *P. flexilipes*, both found by Forrest in 1919 in the wet alpine meadows of the Tibetan province of Tsarong. By the rule of priority *P. firmipes* must be the name of this graceful slender plant with its orbicular or elliptic cordate deeply crenate-dentate long petioled leaves and umbels of 2–8 nodding yellow flowers which first opened in our gardens in 1924. His only other addition to this Sikkimensis section was *P. pseudosikkimensis*, a calciphile plant of the Li-chiang Range, picked in 1906. Experience of it in culture has shown that it is nothing more than a habitat form of the widespread *P. sikkimensis* which ranges in the Himalaya from Nepal to Bhutan, in southern and eastern Tibet, in the Chinese provinces of Sikang and Yunnan and just within the frontiers of N.W. Burma. One of the many discoveries of Sir Joseph Hooker during his memorable exploration of Sikkim in 1848–49, it has been in culture since 1851.

Another of Hooker's fine discoveries, in the Lha-ch'en Valley of Upper Sikkim in 1848, and also widespread from Sikkim through Bhutan, to S.E. Tibet and to just within the boundaries of N.W. Yunnan and N.W. Burma, is *P. Dickieana*. Not until 1921, in the Salween-Kiu-chiang Divide of S.E. Tibet, did Forrest encounter this species—somewhat anomalous among the Amethystina primroses with horny-margined leaves by reason of the patent corolla-lobes and the markedly hairy corolla-tube—and he was unsuccessful

in bringing it into cultivation. But he did introduce a species of the same alliance, one of Delavay's 1884 Tali discoveries, the violet or amethyst bell-flowered *P. amethystina*. He procured it on his first visit to the Tali Range in 1906, and though the species flowered in Edinburgh ten years later, no seed was set and it was soon lost. The subspecies *brevifolia*, rather taller than the typical plant and with more numerous more irregularly lobed corollas, Forrest discovered in 1905 on the Mekong-Salween Divide, and brought it into cultivation in 1915. Occasionally it has been seen since, but always it is very short lived. *P. Valentiniana*, named after Père Valentin, missionary in Yunnan, and with cherry red bells, is fairly common in the peaty alpine meadows in S.E. Tibet and also within the frontiers of Burma and the extreme N.W. corner of Yunnan, often at elevations of nearly 17,000 ft. Though Forrest's seeds germinated there is no record of the plants reaching the flowering stage. Of the fragile *P. silaensis* with small bells of purplish-mauve, a Soulié discovery on Mt. Sila on the Mekong-Salween Divide in 1895, which has been collected not only by Forrest, but by Ward, Farrer and Rock, there is not even a record of seeds having germinated.

Forrest was equally unfortunate in his attempts to introduce the few Petiolares Primulas he collected. These species are mostly high alpines, flowering and fruiting in the early months of the year, usually much too early for the normal visitation time of the seed collector. Moreover the seeds either do not remain viable for any length of time, or resent the usual drying processes before transit. At any rate scant results have attended the seed gatherings of these species sent from the Himalaya for over sixty years and from China for close on fifty years. The few Petiolares species which today are well established in gardens and threaten to rival in popularity the Candelabra species are the results chiefly of the air-mail carriage of living plants from the Himalaya and from Tibet. One of Forrest's few new additions to this section, *P. taliensis*, was in culture for a short time in 1934, but not through Forrest, but through Mr. T. Hay of Hyde Park who was the receiver of living plants sent from Hpimaw in Upper Burma. Another new species, the very striking *P. coerulea*, the shortly stalked elliptic to oblong lanceolate leaves covered below with pale tawny septate hairs and with the 1–3 rich purplish-blue flowers sometimes 1½ in. in diameter, carried on a scape at most 4 in. tall, he found in 1906 on the Tali Range where apparently it is endemic and rare. From his seeds one or two young plants were raised in Edinburgh in 1913, but they failed to reach the flowering stage. Only two other species he found of this alliance have flowered, and though Forrest gathered seeds of both, neither are his discoveries. Ward was the original finder, describer and introducer of *P. vernicosa* which flowered in Britain in 1916, but with its small white or bluish flowers tightly packed together in the centre of the expanding leaves, it is not a plant of great horticultural merit. On the contrary, *P. sonchifolia*, in many ways the finest of Delavay's many fine discoveries of 1884, is of great garden value, though

with most growers it has proved rather intractable. Forrest realised its horticultural merit (even though he misidentified it and described it as *P. gratissima*!) when he first met with it in 1906 on both the Tali and the Li-chiang Ranges, and commented on it thus . . . "a charming alpine and one of the first to show on the disappearance of the snows. In many instances I found specimens which had actually forced their way through the snow. In such cases the surrounding white showed to the greatest advantage the rich blue of the flowers." Forrest subsequently repeatedly collected it, as did Ward, Handel-Mazzetti, Schneider, Rock, Farrer and Cox, for no collector could resist picking so charming a plant, and thus its area of distribution has been extended from the Tali and Li-chiang Ranges, to the Chungtien Plateau, to the Tibetan province of Tsarong, to the Muli district in Sikang and to the Burmese frontier near Hpimaw. Previous to the successful 1930–31 introduction of living plants from Burma in bamboo stems with ice packing—a story which is now familiar—seedlings were raised in Edinburgh from Forrest's collecting of *P. gratissima* but did not prosper, and many subsequent sendings of seeds did not even germinate. Neither has seed germination been recorded for *P. sinuata* and for *P. euosma*; in any case neither are plants of any garden value. But the plant named in honour of his friend Mr. Klaver, a missionary in Yunnan, *P. Klaveriana*, is quite one of the most beautiful Forrest ever collected, and again the few seeds he managed to garner never germinated. The flat rosette of large bullate obovate leaves and the green-eyed lavender-blue corollas on scapes some 4–5 in. tall, make it a most outstanding species. It occupies a narrow zone by the margins of shady thickets and by the streamsides on both sides of the Burma-China frontier, at elevations of 8–10,000 ft.

The Burmese side of this same frontier is the home of the Denticulata primrose, *P. limnoica*, found by Forrest in 1919 and by Farrer two years later, and flowering in culture in 1921 when it was raised from Farrer's seeds. This plant does not merit specific status. It is but a form of *P. alta* (perhaps best regarded as a subspecies of *P. denticulata*) which embraces the Chinese and Burmese representative of the dominant Himalayan *P. denticulata* and which Forrest gathered in Yunnan near Tengyueh in 1913. Likewise *P. sinodenticulata* from the Tali Range is nothing more than a minor variation on the theme of *P. alta* with which, like *P. limnoica*, it must be regarded as synonymous. Another Chinese expression of *P. denticulata* is *P. pseudodenticulata*, which when first found near Tali by Delavay in 1882, was regarded as a variety of *P. auriculata*, native of Asiatic Turkey, Persia and the Caucasus. When Forrest collected it on his first expedition he took it to be a form of *P. farinosa* but in 1911, when it was in culture from his seeds, gave it the MS. name of *P. nessensis*. Occasionally, especially in boggy situations, this species develops vigorous stolons. One such stoloniferous form was named *P. stolonifera*, which name must be reduced to the synonymy of *P. pseudodenticulata*. In the same fashion the Himalayan *P. capitata* is represented in China by *P. sphaerocephala*, one of Forrest's

earliest collections of 1904 from the Kari Pass in Yunnan, which Bees introduced from his seeds in 1908.

If *P. denticulata* and *P. capitata* in their typical form do not reach China, a third Sikkim species, *P. geraniifolia* does—just; for Ward has recorded it from the Yunnan side of the Mekong-Salween Divide. On Ka-gwr-pu, on the Tibetan side of the same divide, Forrest collected it in 1917, though his specimens were described under the name of *P. humicola*. Simulating the habit of a Cortusa, with graceful loose trusses of rosy flowers, this charming plant flowered at Kew as long ago as 1887, some five or six years after Hooker had described the original specimens from the Chumbi Valley. It is hardy in culture and fairly well established—just as are the two Franchetian species *P. septemloba* and *P. polyneura*. The former, in general aspect strongly resembling *P. geraniifolia*, occurs in moist shady situations in the mixed forests of N.W. Burma and S.W. Sikang, at elevations of 10–14,500 ft. Forrest's first encounter with it was in 1906 on the Li-chiang Range, twenty-two years after Delavay had first recorded it from near the foot of the Li-chiang Glacier. The material on which Franchet based *P. polyneura* was collected in part by Soulié near Tatsienlu, and partly by Prince Henri d'Orleans on the road from Batang to Litang. It is a most plastic species, showing a high degree of variability in size and vigour and in the amount of pubescence or of woolly coating on the lower side of the leaves. These variations, occurring in each of the three provinces of Western China where the species appears to be fairly common—Kansu, Sikang and Yunnan—from time to time have been given specific names such as *P. hymenophylla*, *P. lichiangensis*, and *P. Veitchii*, the latter name the one under which *P. polyneura* usually has been cultivated in this country since its introduction in 1905 from seeds secured by E. H. Wilson in 1904 from Sikang. Three close allies of *P. geraniifolia* on the other hand, all of them quite outstanding plants and all new to science, never became established in our gardens. The pale yellow flowers and deeply cordate leaves of *P. Pauliana* were first seen in Britain in 1923. They were grown from the seeds Forrest collected the year previously, near Yungning in S.W. Sikang. Forrest never saw it again after 1922, and it is now lost to cultivation. The first specimens of *P. eucyclia* were collected by Forrest in 1921 in the Tibetan province of Tsarong at 14–15,000 ft. altitude, "growing in crowded colonies, forming mats many yards in extent sheeted with bloom, in stony alpine meadows and . . . also . . . on cliffs". The flower colour varies from pale shell-pink to dark mauve. Five years later it was found again, this time by Ward in Upper Burma, at the much lower elevation of 10–11,000 ft., and one of the plants which was raised from Ward's seed gained the Award of Merit in 1930. As for the Yunnanese *P. sinomollis* with its great soft lobed leaves and two foot scapes of as many as seventeen whorls of magenta or rose flowers—it was in culture under the name of *P. sylvicola* during 1913–18, but was lost soon afterwards. How different the fortunes of *P. mollis*, raised from seeds gathered by Booth in Bhutan

about 1852–53, and flowering in 1854. This plant was not again seen in the wild until 1905, when J. C. White the then political officer in Sikkim found it in the Bhutan highlands. Thus for fifty years it was known only from garden material and all the garden stock of it had originated from Booth's original seeds. Rather remarkably, when in 1915 Forrest met with it in the wild in the Salween-Shweli Divide in Yunnan, his material was described by Balfour as *P. seclusa*! *P. mollis* is essentially a greenhouse subject and is doubtfully hardy even in the milder parts of the country.

P. obconica is likewise eminently suitable for greenhouse decoration. Material gathered by Consul T. Watters in 1879 in the neighbourhood of the Ichang Gorges of Western Hupeh, formed the basis of Hance's description. In the same year and in this same locality, Maries, collecting for the firm of Veitch harvested seeds of various herbaceous plants and when these were sown at Chelsea, *P. obconica* was among the resulting plants—a somewhat fortuitous introduction. The plants flowered in 1880 and the following year were figured in the *Botanical Magazine* by Hooker, though under the name of *P. poculiformis*—a name which must give place to *P. obconica*. It should be noted that Watters was not the first to gather this species, for the Paris Herbarium contains material found by David at Mupin in 1869. Apparently Forrest procured the true plant only twice—both times on the Tali Range. But he did make copious gatherings of what he regarded as microforms of *P. obconica*, the most important of which is *P. werringtonensis*, taken from the Li-chiang Range in 1913 and the specific name of which refers to the Cornish garden where plants grown from Forrest's seeds first flowered. Unlike *P. obconica* this plant appears to be quite hardy out of doors. *P. parva*, a miniature of *P. obconica* and possibly merely a xeromorphic state of this species, is a dweller on the limestone cliffs of Yunnan-fu where Forrest saw it once, in 1904, without procuring seeds. Neither was he able to take seeds of *P. dumicola* which he found in 1922 in Tsarong, near the Yunnan frontier six years after it had been discovered by Handel-Mazzetti: "on granite rocks along rivulets in the dripping cold temperate mixed forests above the Irrawaddy Divide between 8–9,000 ft., already fruiting in the beginning of July". Ward reports finding it in 1931, in the A-tung Valley of Upper Burma. And in Upper Burma too, Ward was the first finder of the slender *P. densa* with the ovate leaves no more than an inch long at the time the rose-pink flowers are blooming on 1–2 in. scapes. Forrest got this plant only once, some distance to the south-east of the type locality and its incidence in cultivation is due to Ward's collections of seeds. But more important by far than these is *P. sinolisteri* described from specimens Forrest collected on the Tali Range in 1906. Introduced into culture and flowering in the spring of 1908 Balfour forecast a great horticultural future for it, believing that, lacking the irritant property of *P. obconica*, it would prove a better greenhouse plant. Although this forecast has not materialised, nevertheless the compact "ivy-leaved" shaped foliage and the many trusses of

Photo, G. Forrest

PRIMULA MALACOIDES IN THE WILD
an outstanding horticultural introduction

flowers varying from lilac to white, have made *P. sinolisteri* a valuable acquisition.

Balfour's estimate of the horticultural value of another Forrestian introduction was much nearer the mark. But even he could have had but little indication of the tremendous success it was destined to achieve in cultivation, when he foretold a successful career for *P. malacoides*. This species is, beyond all debate, Forrest's most important introduction. Once again Delavay was the first in the field and his specimens came from Tali in 1884. Strangely enough Delavay's seeds when sent to Paris failed to germinate. Forrest had better luck. In 1905–6 he found it abundant in the fields in the Tali Valley. It flowered for the first time in Britain in 1908, and most probably the entire European garden stock today is derived from Forrest's first sending of seeds. *P. malacoides* is widespread throughout Yunnan, in parts of Kueichou and just within the northern frontiers of Burma. Apparently it does not extend into Sikang, but its close ally, *P. Forbesii*, still another Delavay plant from Tapin-tze near Tali, does. Described by Franchet in the same publication as *P. malacoides* it has a longer, though less distinguished horticultural history, for it was brought into cultivation in 1891 by M. Vilmorin of Paris and still persists as a greenhouse plant of fairly easy culture. Another close kinsman, *P. effusa*, appears to be confined to a relatively small area in and around the gorges of the Yangtze Bend from about 100°–102° E. Though described from material secured by Forrest not far from Fengkow and the Sikang border in 1914, it was discovered almost simultaneously by Handel-Mazzetti in the subtropical gorges of the Yangtze on the direct road from Yunnan-fu to Hweilichow. Much less success has attended its culture, for well figured in the *Botanical Magazine* in 1927 (t. 9121) it is now doubtfully present in any plant house in Europe. And of Forrest's one other addition to the Malacoides section, *P. aromatica*, discovered in 1921, there is no cultural record. Nor is there likely to be, for it is a most fragile thing affecting the shady grottoes of the limestone cliffs 10–1,000 ft. high on the Chungtien Plateau and the mountains of Sikang around Muli.

This then, imperfectly, inadequately, is the story of the Primulas. To have lived down these years of high endeavour when Forrest stood pre-eminent among plant hunters, handling his beautiful material either in the herbarium or in the garden, must have been a rare privilege, a privilege the like of which is unlikely to be given to man again. But if perchance days as golden as these should dawn once more it may be that a new generation of horticulturists will persuade some of the lovely lost treasures which few eyes have seen either in the wild or in captivity, to look more kindly at our gardens—and sojourn longer in them.

Photo, R. Eudall

ACER FORRESTII

The trunk of a tree in the Royal Botanic Garden, Edinburgh

ACER

Many of the more handsome Maples native to China are to be found in the Forrest collections. The genus Acer has a wide distribution in that country and different species have been gathered from every district in which Forrest harvested seed.

Named in honour of the collector, *Acer Forrestii* (F. 2016 type) is a member of the Macrantha section and has a very attractive snake-skin bark, the light irregular fissures in the stem making a charming pattern on the darker green background. This feature is much appreciated during the winter months when the tree is devoid of its foliage. Found growing in the shady valleys on the eastern flank of the Li-chiang Range, where it is often a medium sized tree, it thrives in mixed forests and grows gregariously to form thickets. The glabrous leaves have finely serrated margins and a glaucescent under surface. The colour of the flowers ranges from olive to brownish-green and these are followed in autumn by reddish fruits.

Another species with decorative bark, *Acer Davidii*, is found growing in Yunnan, S.E. Tibet and Szechwan in mixed forests at an altitude of from 6–12,000 ft. where it grows as a shrub or tree, sometimes reaching a height of 60 ft. The flowers are yellowish-green and are produced in terminal pendulous racemes on the small leafy spurs, while the deciduous ovate leaves, unevenly serrated at the margins, turn a brilliant crimson before falling in the autumn.

In Yunnan, in the Lu-tien Valley, and the Yangtze-Mekong Divide, *Acer Oliverianum* grows in mixed forest, and may reach a height of from 30–45 ft. Often it lines the banks of the streams in much the same way as does the Willow in this country.

At 8–12,000 ft. above sea level, in S.E. Tibet, as well as in Yunnan, *Acer tetramerum* flourishes, forming a tree 20–30 ft. in height. The deciduous lobed leaves are deep green above and light green below and in the autumn the trees are festooned with yellowish-brown fruits.

Besides these, other species of which seeds were sent to this country by Forrest, are *Acer amplum*, *A. Campbellii*, *A. Giraldii*, *A. laevigatum*, *A. Paxii*, *A. robustum*, *A. taronense*, and *A. Wardii*.

Photo, G. Forrest

ACONITUM FORRESTII

ACONITUM

Both from a botanical and horticultural point of view the genus Aconitum can be divided into three groups; only two of them, however, concern us. Of the small Lycoctonum alliance which includes 13 Chinese species and which is characterised by the conical shape of the upper sepal, Forrest collected 4 species, 3 of them new to science. The most attractive of these is *A. brevicalcaratum*, a plant of 2–3 ft. in height with tight racemes of dull livid purple flowers. It is distinguished in cultivation by its assurgent foliage; the upturned leaves on both sides of the shoots expose their snowy-white under surface.

The second large group, the Napellus alliance with the upper sepal hood-shaped instead of conical, is represented in Forrest's gatherings by 27 species, of which 10 were new. They are mostly plants for the herbaceous border but only one of them is in cultivation, *A. Forrestii*, an erect perennial 2–5 ft. high, with a thick stem clothed with light green, more or less glabrous, tripartite leaves, bearing a dense raceme of deep purple-blue flowers on short pedicels. The inflorescence axis is covered with spreading yellow hairs and these are present to a lesser degree on the flowers. In cultivation the leaves are much more deeply divided than in the wild state. Like many others *A. Forrestii* is easy to grow, showing no preference for any particular type of soil.

Another Forrestian discovery, *A. transectum*, resembles the above species though this plant is much less hairy and possesses much longer pedicels. Yet another, *A. brachypodum*, of which he collected copious material, has a short tight head of blue flowers and finely cut foliage.

Along the eastern flank of the Tali Range and the Nmai Hka-Salween Divide Forrest found a new climbing species, *A. Bulleyanum*, which is a plant 3–4 ft. tall with red or blue-purple flowers. In 1924–25 he made several collections of a plant which, although it is not particularly attractive, is interesting in that the leaves resemble those of a Caltha; it is aptly named *A. calthifolium*. Other new species of his are *A. Georgei* and *A. phyllostegium*.

Of the dwarf smaller species, first place must be given to *A. pulchellum*, first collected by Handel-Mazzetti in 1915. A plant of 6–9 in. in height, it would make a fine addition to the rock garden if it could be brought into cultivation. Gathered by Forrest in the Mekong-Yangtze and Mekong-Salween Divides, it grows at altitudes of 12–14,500 ft. in open alpine pasture and on screes and cliff ledges.

It is a matter of regret that more of these hardy Chinese perennials have not yet been introduced into British gardens.

ADENOPHORA COELESTIS

in the Rock Garden,
Royal Botanic Garden,
Edinburgh

Photo, R. M. Adam

ADENOPHORA

Very remarkably, of the 10 species of Adenophora collected by Forrest all but one are new to science; the exception is *A. capillaris*, discovered by Henry in the Pa-t'ang district of Hupeh and recorded by Forrest from Upper Burma and Yunnan. Moreover Forrest gathered all his 9 new species during his first expedition, although one of them *A. confusa* was not recognised as a new plant until 1936. These observations, coupled with the facts that during his later expeditions Forrest collected comparatively few specimens of Adenophora and that some species are still known only from the type gathering, suggest that our knowledge of this genus is as yet far from complete.

As far as we know them, the 10 species fall into two quite distinct habit types. The species of the first group have a paniculate inflorescence with numerous flowers borne along the main stem and the lower branches. This group includes *A. Bulleyana* (F. 2653 type), from the Li-chiang Valley, *A. capillaris*, *A. confusa* (F. 6282 type) from the Li-chiang Range, for thirty years confused with *A. diplodonta*, *A. leptosepala* (F. 3857 type) from the Tali Range, and *A. ornata* (F. 3861 type) also from the Tali Range. The species of the second group on the other hand all have unbranched stems with a few large flowers borne towards the apex (only occasionally is there a lower branch) and with the leaves more or less crowded in the lower half of the stem. Within this group belong *A. diplodonta* with long exserted styles (F. 396 type) from the dry hillsides of the Mekong and Yangtze Valleys, *A. Forrestii* (F. 394 type) and *A. pachyrrhiza* (F. 3860 type) both from the Tali region and both with narrowly lanceolate leaves; *A. megalantha* (F. 2661 type) from the Li-chiang Range and the only known collection, and *A. coelestis*, another Li-chiang plant (F. 2718 type).

Cultural records of these Chinese species are few, and as far as the writer can judge, probably inaccurate. At any rate, photographs are available in Edinburgh of plants growing in the rock garden, under the names *A. Forrestii* and *A. ornata*, which prove that the plants in question are *A. coelestis*, certainly the finest species of them all and probably the only one which has been in cultivation. After Forrest first encountered it on the Li-chiang Range in 1906, he made several later collections, as did Schneider, Rock and Handel-Mazzetti. Most of the gatherings are confined to a comparatively small area extending from the neighbourhood of the Li-chiang

north-westwards to Chungtien, though Rock has extended this somewhat restricted range to the Muli district of Sikang. It is a native of stony alpine pastures, screes and limestone drift, crevices and ledges of limestone cliffs, open places in scrub, and ranges in altitude from 10–12,000 ft. It is moreover a variable plant, sometimes no more than 4 in. tall and with a solitary flower, or again as much as 24 in. in height with as many as six flowers. And though the flower may vary from white to light or deep blue, even to violet, they are always beautifully bell-shaped, as much as 3 cm. long and broad, and thus quite magnificent for this genus.

ALLIUM

It can readily be understood that a large genus like Allium with its wide distribution in the Northern Hemisphere would have its quota of members in Western China. Proof of this is found in the amount of material collected by Forrest covering over 20 species and varieties, several of which are entirely new.

Most people fight shy of Alliums in their flower gardens and this may be one of the reasons why the more beautiful of the new species are not in general cultivation. As to the species which honours the name of the collector, *Allium Forrestii*, it may be that as it is very late in flowering in its native home—September and October—it does not set many fertile seeds. *Allium Forrestii* was first collected in 1906 in the Li-chiang Range and again in 1910 in the same area. In the later expeditions of 1917 to 1919 it was collected in Tsarong in S. E. Tibet and its distribution was further extended by the collection of material in S. W. Szechwan in 1921. It is a pretty species from 4–16 in. in height, with narrow strap-shaped leaves and shortly stalked flowers, about six to an umbel. The flowers, which are bell-shaped and pendulous, are about half an inch in length and vary in shade from deep claret-red to ruddy purple. Unfortunately it is not now in cultivation.

Very similar in every character, except colour, is another new plant, *Allium Beesianum*. In this species the colour of the flowers varies from pale to deep China-blue; white forms were also collected on the Li-chiang Range. Little need be said of *A. Beesianum* as it has been a familiar garden plant for many years.

Of his other introductions only two are in cultivation, *A. Mairei* (*A. yunnanense*) and *A. amabile*. Both of these are comparatively rare plants, the latter being the less familiar of the two. It is a delightful plant 4–8 in. high with narrow grass-like leaves and umbels of pendulous, bell-shaped, magenta-red flowers from July to September. It was found by Forrest on the N.W. flank of the Li-chiang Range and on the Chienchʼuan-Mekong Divide. It is a true alpine growing abundantly in stony alpine meadows at altitudes up to 14,000 ft.

ALLIUM BEESIANUM
in the Royal Botanic
Garden, Edinburgh

Photo, R. M. Adam

A. Mairei has a wider range over the whole of Yunnan and southern Szechwan. It is similar in habit but of a more rigid growth with stiffer broader leaves. The flowers are white or a delicate pale rose with darker spots and veining. *A. pyrrhorhizum* is a close ally.

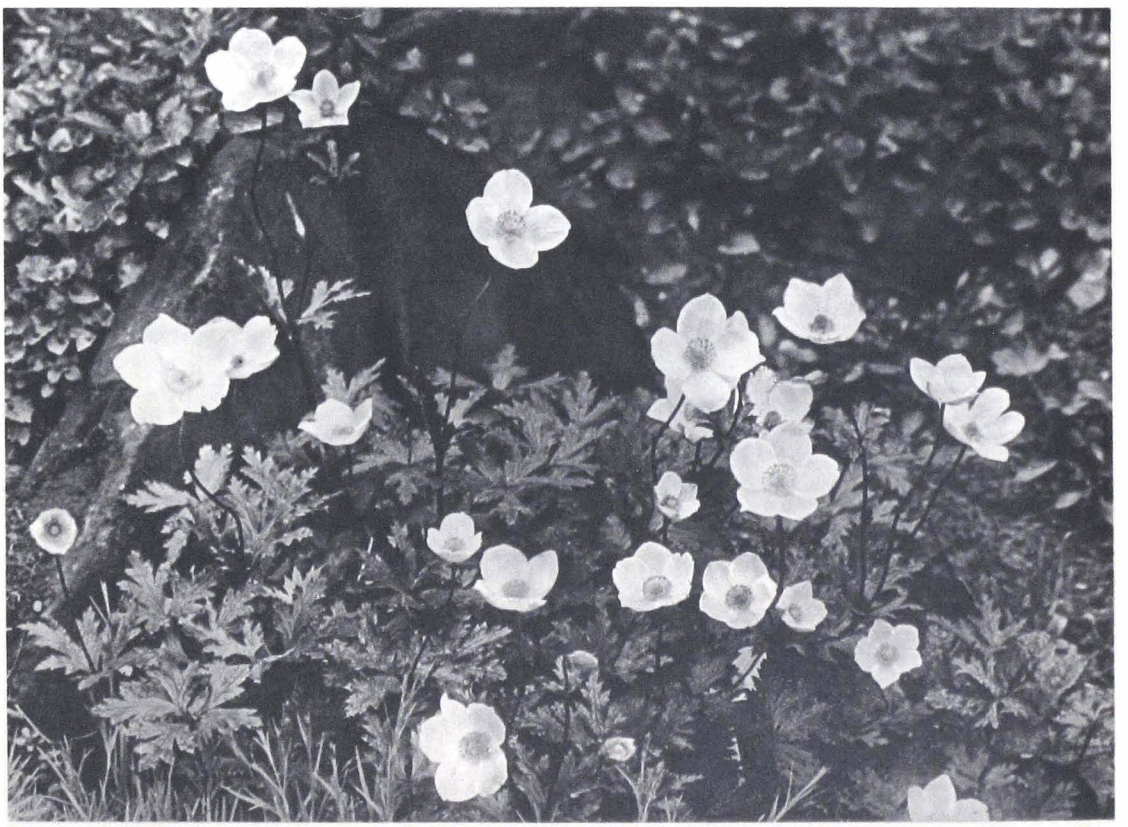
Found also in the earlier collections was the new *Allium Bulleyanum*, a plant growing up to 2 ft. in height with large umbels of open deep maroon flowers. Allied to this new species and with a similar distribution is *Allium polyastrum*, which differs in having large magenta-rose flowers.

An unusual new species not now in cultivation, *Allium chalcophengos* is a dwarf plant with a large capitate inflorescence of deep rose-crimson flowers of which the tips and sometimes the bases are marked with brassy yellow. Among other introductions, but again not now in cultivation, are *A. nanodes*, *A. eusperma*, *A. kansuense*, *A. macrostemon*, and *A. Prattii*.

Alliums are relatively easy to grow if certain requirements are observed. All species like a well drained soil but must never be too dry. A sunny position is essential.

Photo, G. Forrest

ANDROSACE SPINULIFERA



Photo, D. Wilkie

ANEMONE RUPICOLA

ANDROSACE

Forrest found *Androsace spinulifera* of the Chamaejasmoid group in 1906 during his first expedition to Yunnan. Three years later it was flowering in British gardens. The Abbé Delavay had discovered it in 1884 and Franchet described it as a variety of *A. strigillosa* a plant of Upper Sikkim and Chumbi. In subsequent years Forrest made some twenty gatherings of *A. spinulifera* so that its distribution, vertical and horizontal, is now fairly completely known. It ranges from the mountains of the Yangtze-Tali Divide to N. W. Szechwan at altitudes of from 8–9,000 ft. Locally it is very common and the edges of dry shady pine-forests seem to be the habitats most favoured. Here plants attain their greatest beauty and luxuriance with summer leaves more than 6 in. in length. On dry barren limestone conglomerate at the lower limit of its range, and at high altitudes, *A. spinulifera* becomes dwarfed, with the leaves barely exceeding $1\frac{1}{4}$ in. in length, very grey, and spinescent at the tip. It is because of this latter character, of course, that the species is so named. Vegetatively, with the large summer leaves springing from the close spiny sempervivoid rosettes, the plant is striking enough. But when in flower, with the numerous round-petalled corollas sometimes $\frac{1}{2}$ in. in diameter, clustered in a semi-globose or depressed head at the apex of a scape as much as 12 in. in length, it is a thing of great beauty. Unfortunately the full colour range of the flowers has not been captured in cultivation; most growers are familiar with a light or dark shade of lilac-pink but few have experienced the rich glowing rose-pinks, violets, blue-purples, deep crimsons or scarlets of native specimens.

Three other species collected by Forrest have been in cultivation. The vermilion-flowered *A. Bulleyana*, he found in Yunnan and S. E. Tibet; the large round leaved *A. Henryi*, first found by Dr. Augustine Henry in Hupeh, Forrest recorded from W. Yunnan and the Burmese border; whilst the Himalayan *A. geraniifolia* he also gathered in Yunnan.

His other gatherings, over a dozen species, still have to be seen in British gardens. Some of these, such as the beautiful high alpines, *A. Wardii* and *A. Delavayi* and the annual *A. saxifragaefolia* (which Forrest described as a new species *A. minutiflora*), had been previously found by Ward, Delavay and Bunge, respectively. But of 4 species he was the discoverer; the compact and dainty *A. mollis* and *A. rigida*—both at first confused with *A. Chamaejasme*; the Soldanella-leaved *A. Graciae* and the somewhat inferior plant which bears his name, *A. Forrestiana*.

ANEMONE

Discovered first in Kashmir by Victor Jacquemont in 1831, *Anemone rupicola* has a wide range which extends eastward along the Himalaya and into S. W. Tibet, Szechwan and Yunnan at elevations of 11–15,000 ft. Forrest gathered it several times on the Li-chiang Range, on Bei-ma Shan and the Salween-Kiu-chiang Divide. It is a close ally of the well known *A. sylvestris* and belongs to the section *Hyalectron*, having a rhizomatous rootstock, an unbranched inflorescence and achenes covered with long white silky hairs. It is not so vigorous as *A. sylvestris* and does not thrive under dry conditions.

The white flowers, solitary or in pairs, are suffused with purple on the outside of the broad tepals which may be as much as 1½ in. long. The purple tinge manifests itself also on the underside of the deeply cleft dark green leaves. The hairiness of the leaves is variable, and extreme conditions—markedly hairy and almost glabrous—have been designated var. *sericea* and var. *glabriuscula*.

Forrest sent home seed of his 1913 gathering and so this plant was introduced into cultivation, receiving an Award of Merit from The Royal Horticultural Society in 1915. Although today this is a comparatively well known plant, it has never been common in English gardens. Col. F. C. Stern has found that *A. rupicola* is easy to raise from seed at Highdown and that it does not appear to have any preference for a particular type of soil. It flowers in sun or shade but best perhaps in half shade facing north. This is confirmed by Mr. Clarence Elliott, who also mentions that it can be propagated either by seed or by division in spring or early summer. On the whole this has proved a better plant in Scotland than in southern England.

The most remarkable Anemone introduced by Forrest is *A. glaucifolia*, the only member of the section *Anemoclema*, interesting as it comes between the Anemone and Clematis. This species was named by Franchet from its resemblance in the shape of its basal leaves to those of a Glaucium. It has the largest flowers of the genus when it is well grown. It has a long fleshy taproot which resents disturbance and it is unfortunately somewhat tender. Therefore it is best grown in a frame or in very deep pots.

Forrest found it in N.W. Yunnan and Szechwan and wrote of it, "It is a plant 18–24 or even 30 in. . . . The pinnate leaves form a dense basal rosette and, as with all the other parts of the plant, are densely coated with

silvery down. The flowers . . . range in colour from clearest blue to shades of purple. It is a glorious plant."

This species raised by Col. Stephenson Clarke in his Sussex garden from Forrest's seed received a First Class Certificate from The Royal Horticultural Society in 1922. Lord Aberconway, who also raised it from Forrest's seeds, recorded that so floriferous were those which flowered that some ten plants produced over a hundred blooms. His experience was that it was best grown when "planted out in a frame with a hot pipe around it".

Anemone japonica (*A. hupehensis* var. *japonica*) was first introduced into European gardens by Robert Fortune, who first found it in 1843 "in full flower amongst the graves of the natives, which are around the ramparts of Shanghae" where "it blooms in November when other flowers have gone by, and is a most appropriate ornament to the last resting place of the dead". Other collectors found it in the coastal provinces but Forrest collected it in Yunnan. One specimen which he collected on the eastern flank of the Tali Range he described as "a plant of 18 to 30 in.; flowers magenta-rose; open situations on margins of thickets" and another "plant of 1½ to 2 ft.; perianth interior purplish rose, exterior silvery; dry rock pasture land at the base of the eastern flank of the Tali Range; lat. 25° 40′ N.; alt. 6,700–8,000 ft." It is interesting to note though that there is one specimen which he described as "plant 1 to 2 ft.; flowers pink; dry open stony situations around Tengyueh; lat. 25° N.; 6–7,000 ft. . . . probably an escape from cultivation". So it is just possible that his plants and those of others from this area in Yunnan may refer to cultivated plants.

Among other species which Forrest collected were the new *A. polycarpa* from the Mekong-Salween Divide, and the extremely variable *A. demissa* and its varieties.

ARISAEMA CANDIDISSIMUM
From a coloured drawing
by Miss L. Snelling
in "Curtis's Botanical Magazine",
t. 9549

ARISAEMA

Eleven species of Arisaema are included in Forrest's collections and three of them, *A. lichiangense*, *A. biauriculatum* and *A. candidissimum*, are new to science.

The first mentioned is apparently endemic to the Li-chiang Range in dry open situations. It is a single-leaved plant 9–12 in. tall with a purple, yellow or green-striped spathe. *A. biauriculatum*, widespread in Yunnan and present also in S.E. Tibet, prefers damp shady places and like the first mentioned species is somewhat variable in the colour of the spathe. Neither of the above plants has been in cultivation.

The third, *A. candidissimum*, has, however, proved to be a valuable acquisition to our gardens. Forrest gathered the type (F. 12724) in the Fengkow Valley, where it grows on open rocky slopes and on ledges of slate cliffs at 8–9,000 ft. The spathe is white or white flushed with rose, sometimes tinged with green at the base, and the large single trifoliate leaf has the middle lobe as much as 7 in. broad and long. The species is quite hardy in this country and has been grown successfully in many gardens as for instance at Glasnevin, in Aberdeen by the late Dr. Cromar Watt, and by Mr. A. K. Bulley, whose plant received the Award of Merit in 1924 from The Royal Horticultural Society.

A. elephas, like *A. candidissimum*, possesses a large trifoliate leaf, but the spathe is maroon-purple, with white or cream-coloured stripes. Delavay first collected this species in 1886, in the forests of the Lo-p'ing-shan, north of the great Tali Lake. Forrest not only established its extension throughout the Li-chiang Range and westwards to the Yangtze-Mekong Divide but also introduced it to British gardens.

A. consanguineum was described from the Himalaya but is present in at least five Chinese provinces. Forrest collected it many times in Yunnan, and probably it was introduced by Wilson from Hupeh. The pedate leaves have narrow segments ending in a distinctly filiform tip.

On one occasion only did Forrest find *A. flavum* and that in 1921 in the mountains N.E. of Atuntze. In the same year Kingdon Ward met with this species in the Shui-lu Gorge and the following year in the Litang River Gorge. These gatherings are of great importance for they mark a considerable extension in the range of a species which is widely spread in the Himalayas. *A. flavum* has a long cultural history for it was figured in the *Botanical Magazine* (t. 7700) in 1900, from plants raised at Kew from seeds sent there by Duthie from N. India in 1896.

Photo, G. Forrest

ASTER STATICIFOLIUS

Photo, R. M. Adam

ASTER FORRESTII

ASTER

Throughout his many journeys in China and the adjacent countries, Forrest came across a considerable number of species of Aster; in all, he collected over a hundred and thirty specimens. Like other parts of the world, China has its complement of weedy species but these are more than balanced by those of garden value, and we are indebted to Forrest for the introduction of many useful plants into this country.

It is difficult to assess how many new species and varieties were collected by Forrest because the various authorities on the genus disagree as to whether collections represent new species or mere varieties of previously described ones. This applies to the plant which commemorates his name—*Aster Forrestii*. Soon after its introduction into this country, it became known as *A. Forrestii* and this name was used when it was described in the *Bot. Mag.* (t. 9123) by Stapf in 1927.

Aster Forrestii (F. 16777 type) was first discovered by Forrest in 1918 on the Khakarpo, Mekong-Salween Divide at 14,500 ft. and in 1921 on the Londre Pass, somewhat south-east of the Dokar La. In a later expedition it was again collected, this time from east of Atuntze. The habitat is given as open alpine pastures and stony alpine meadows.

In cultivation it has proved a valuable addition to the rock garden where it flowers over a long period. A perennial, 6–18 in. high, it produces tufts of deep green leaves about 4 in. in length and from each of these tufts arise a few flowering heads. The flowers are over 2 in. in diameter and the ray florets are purple-violet, and the disc florets a rich orange.

A species which Forrest introduced, and which he praised very highly in the *Gardeners' Chronicle* of 1916, is *Aster staticifolius*, a very distinctive plant of shrubby habit. This species was first discovered by Delavay in the mountains around Li-chiang and Hoking (half-way between Tali and Li-chiang) but Forrest states that it grows in all the mountains of N.W. Yunnan north of latitude 25°. His first collection was in 1916, when he introduced it into this country.

Of bushy habit and less than 2 ft. in height, *A. staticifolius* produces a great number of small leafy flowering stems. In its native habitat it probably lives for well over ten years, but in cultivation it is inclined to become leggy and requires renewing either from seed or cuttings. It is probably best planted in a scree where it maintains its compact habit.

Of its behaviour Forrest writes, "On one single plant I counted almost 400 heads, and have seen others which unquestionably bore even a greater number. Individual plants attain a height of 1½–2 ft. and form compact rounded shrubs of which the younger growths generally die back each season. In some of the highest and most exposed situations on the more barren screes, the species distinctly assumes a cushion habit, all parts being completely hidden by the short stemmed blooms." The flower heads are over 1½ in. across, the ray florets are bluish-purple and the disc florets bright yellow.

There are many other species and subspecies all of garden value nearly related to *A. diplostephioides* such as *A. Bulleyanus*, *A. likiangensis* and *A. yunnanensis*. These were collected throughout Yunnan and Szechwan at altitudes from 11–12,000 ft. in alpine pastures and all have proved hardy in this country.

Another species of dwarfer habit, *A. brachytrichus*, would appear to be very common in the wild as nearly twenty different collections were made during the various expeditions. It is a very free flowering plant forming tufts of deep green leaves and sending up flower heads of deep purplish-blue.

Similar to this species is *A. Jeffreyanus*, a new species found by Forrest in his first expedition in 1904 near the Li-chiang Peak at 10,000 ft. This plant, about a foot in height, has deep lavender ray florets and rich orange disc florets.

Another new species, of which there is no record in cultivation, is *A. mekongensis*. Many of the specimens are about a foot high but others, especially those from the high altitudes, are only about 5 in. in height. First collected on the Li-chiang Range in 1913 on stony alpine pasture, it was subsequently found on the ledges of cliffs and screes in Tsarong, S.E. Tibet. It is not unlike *A. Bietii*, a dwarf species well established in cultivation.

Aster Bietii grows very quickly, forming deep green tufts of leaves and sending up many flower heads of lavender-blue throughout the summer. It is an ideal subject for the rock garden or in the front of a flower border. Forrest found it in Yunnan and Tibet along with *A. oreophilus* which closely resembles it.

Quite distinct from all the foregoing is *A. fuscescens* which Forrest found throughout Yunnan and also in Upper Burma. It grows as high as 2½ ft. and has heads of smaller flowers of pale purplish-blue ray florets, with dull orange disc florets. It has been in cultivation for many years.

BERBERIS

In George Forrest's collection of plants there are many barberries, a few of which are new species. Most of them are worth including in the shrub border or the rock garden for the value of their flowers, foliage and fruit.

Amongst his new introductions *Berberis replicata* must stand supreme. It was first collected in 1913 in S.W. Yunnan where it was found growing in an open rocky situation. This species has an advantage over many of its congeners by being an evergreen but still providing autumn tints with its foliage. During the late autumn a number of the older leaves turn bright crimson before dropping, in striking contrast to the purple-black of the fruits. The leaves of this Berberis are very distinct, being shiny above but covered with a white waxy film below. The flowering period of *Berberis replicata* is April-May, when the clusters of golden-yellow flowers are borne. This plant will grow up to 4 or 5 ft. in height, is perfectly hardy and should thrive in almost any aspect. An Award of Merit was given to this species by The Royal Horticultural Society in 1923.

Another new species which gained an Award of Merit from The Royal Horticultural Society in 1925 is *Berberis Jamesiana*. This is a strong growing deciduous shrub which may attain a height of 7 ft. if the situation favours it. Introduced in 1913 from Yunnan, where it grows on the rocky hillsides, this Berberis has proved itself hardy and of easy cultivation in this country. The young growths, purple in colour, are very handsome during early summer. The leaves, in clusters of two to six, are obovate and of firm texture 1–2¼ in. long. Rich yellow flowers are produced in pendulous racemes during May and these are followed later by bright red, translucent fruits which are large and orb-like. This plant is named in honour of a brother of the collector. *Berberis Forrestii* (F. 17143 type) is a native of N.W. Yunnan. There it was found growing in open meadows and pine forests on the west flank of the Li-chiang Range, where it reaches 6–9 ft. in height. This shrub is very decorative in autumn when it is covered with long racemes of scarlet fruit, borne in umbels.

Other new species of Berberis, *B. leptoclada* (F. 330 type), *B. sublevis* (F. 9559 type), an evergreen shrub with large leaves and solitary fragrant orange-yellow flowers followed by black fruit, *B. leucocarpa* (F. 12855 type) similar to *B. Jamesiana* but with pale pink or whitish fruit, and *B. mekongensis* (F. 13204 type) have all been successfully introduced into this country by Forrest. *Berberis centiflora* (F. 4689 type) on the other hand is only to be found in herbaria.

BUDDLEIA FALLOWIANA
a native of Yunnan

Photo, G. Forrest

BUDDLEIA

Of the 18 species of Buddleia collected by Forrest several were new to science. Some of these new plants introduced to European cultivation, *Buddleia Fallowiana* and *B. Forrestii*, for instance, rank amongst the finest species in the genus.

B. Fallowiana is a very handsome upright growing shrub suitable as an isolated specimen on a lawn or in the front of a shrub border. Annually it produces stems 4–5 ft. long which, like the leaves, are covered with down which lasts until well into the winter and gives the plant a silvery-grey appearance. The densely packed flowers borne in terminal and axillary spikes are of a lovely soft lilac shade with a rich orange eye and are delightfully sweet scented. This Buddleia is a native of Yunnan, where it is found growing in dry stony situations, among scrub and in thickets at altitudes of 8,500–11,000 ft. However, it is a tender plant and needs some shelter.

The white-flowered form, *B. Fallowiana alba*, has light coloured tomentum on the leaves and stems; and it requires a background of dark evergreens if it is to be seen to best advantage.

In thickets and on dry cliff ledges in N. W. Yunnan, 8–10,000 ft. above sea level on the Tali Range, grows *B. Forrestii*, a plant which, according to the collector, varies in height from 4–15 ft. In this country, however, it seldom exceeds 4 or 5 ft. The flowers produced on the gracefully arching branches of the current year are lavender when young but as they open the bases of the corollas change to deep yellow or orange, finally becoming pale yellow-brown to orange for two thirds of their length.

B. limitanea, a species closely related to *B. Forrestii*, but less hardy, is practically devoid of all pubescence. This shrub, which could almost be described as herbaceous, has its branches killed back to ground level every year. The young growths which appear in spring ultimately spread to four feet and loose flower clusters form in the axils of the large serrated leaves. The light brown stems are distinctly four angled and often quite obviously winged. The flowers have open corollas and are a light pink to rosy-purple. This species grows at 6–8,000 ft. on the slopes of the Shweli-Salween Divide, Yunnan.

B. heliophila was found by Forrest on the Tali Range at altitudes of 7–8,000 ft. in 1913. It was flowered at Caerhays in Cornwall and there is a fine specimen at Trewithen. It is not outstanding as a decorative garden shrub, but it produces in May and intermittently thereafter rose-lilac, honey-scented flowers.

Photo, R. P. Scase

CAMELLIA SALUENENSIS
at Wisley

CAMELLIA

One of Forrest's most important contributions to horticulture was the introduction of *Camellia saluenensis*, for not only is it a good plant in itself but it has been the parent of a large number of excellent hybrids which have aroused much interest in this country and in America, where *C. japonica* hybrids have predominated.

The seed was originally sent home by Forrest under the name "Camellia speciosa" but when it was first flowered by Mr. J. C. Williams at Caerhays in Cornwall, it was recognized by Stapf, who succeeded, while preparing a description of a plant which had been figured in the *Botanical Magazine* under this same name, to sort out a mass of material previously lumped under this species and *C. Pitardii*. This is a complicated story but it is well told by Mr. J. R. Sealy in his detailed account of the nomenclature of Camellia species (R.H.S. Journ. LXII p. 352). Forrest 17686, collected from the stony hillside of the volcanic mountains north-west of Tengyueh, was later selected by Sealy as the type of *C. saluenensis* from the eight collections made by Forrest, all from the mountains of the Shweli basin north of Tengyueh.

An examination of Forrest's Field Notes shows that there was colour variation ranging from white to pink and crimson although the majority were shades of pink and the type itself a clear rose pink. The plants, ranging from 6 to 15 ft. in height, were found in open thickets and amongst scrub on open rocky hillsides or along the banks of streams at altitudes ranging from 6–9,000 ft. He also noted that some were shy-flowering but fortunately the type in cultivation has proved very floriferous.

Camellia saluenensis was grown from Forrest's seeds at Exbury, Kew, and Kells as well as Caerhays, already mentioned. The Exbury form most nearly resembles the wild material, but there is wide variation among them. Even at Caerhays two different forms can be noted, identical in their deep rose pink flowers but varying in the leaf size. A larger leafed form, known only in cultivation, was described and figured by Sealy as *Camellia saluenensis* forma *macrophylla* (Bot. Mag. t. 9505).

The hybrids of this distinguished species with *C. japonica* have proved excellent decorative shrubs for they have the great merit of being absolutely hardy in Camellia areas, more so than the species itself. Secondly, they shed their dead flowers, while *C. japonica* hybrids retain theirs. Lastly, they

Photo, J. E. Downward

CAMELLIA x WILLIAMSII
A fine saluenensis hybrid

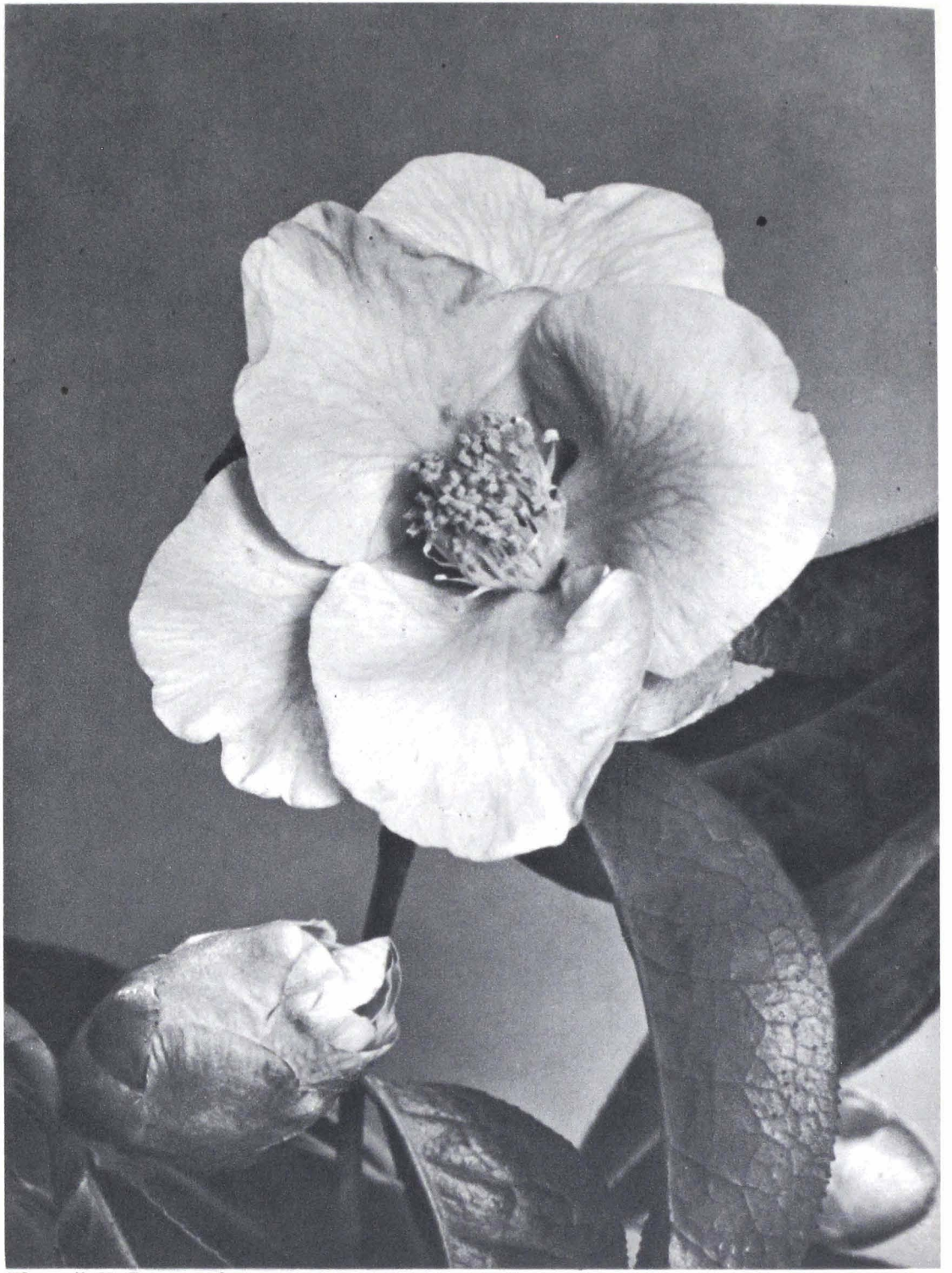
produce an abundance of large single flowers over a long season, surpassing any other hybrids in this respect. Lord Aberconway and Professor Sir William Wright Smith (*R.H.S. Journal* 74) have grouped these under the name *Camellia* x *Williamsii*. Outstanding varieties are "J. C. Williams", probably the best known of all, F.C.C. 1942; "Donation", a semi-double pink of great size, A.M. 1941 and F.C.C. 1952; "Mary Christian" and "St. Ewe", A.M. 1942 and 1947 respectively. "Cornish Snow", *saluenensis* x *cuspidata*, is a very free flowering single white, A.M. 1948, with smaller flowers.

Another equally interesting story is the introduction of the true *C. reticulata*. The semi-double flowered form, so familiar to everyone and so esteemed in Yunnan as a garden plant, had been introduced in 1820 and flowered for the first time in England in 1826. A second introduction was made by John Duncan Parks for the Horticultural Society in 1824 and it was this plant which Lindley described in the *Botanical Register* in 1827. Both these introductions were the double or semi-double garden form. More than a century was to elapse before the wild plant with single flowers was recognized in our gardens.

The scene again shifts to Cornwall, where a plant grown at Caerhays under the Forrest number F. 25352 labelled "C. speciosa" was sent by Mr. J. C. Williams to Dr. Stapf at Kew. He astutely recognized it as the wild form of the cultivated *C. reticulata*. Further examination of the herbarium material of *C. speciosa* revealed a number of gatherings of the wild *C. reticulata* which indicated that Forrest had first collected this plant in 1912 and on three other occasions. The geographical distribution is similar to that of *C. saluenensis*. All Forrest's gatherings were made from open pine forest, scrubs and thickets in the Tengyueh area. Mr. C. Williams received an Award of Merit in February 1948 for a fine seedling of a plant raised from Forrest's seeds called "Mary Williams". The flower was 4 in. in diameter, composed of 8–10 petals, vivid carmine shaded on the outside to Turkey red.

The delightful plants at Trewithen in Cornwall raised from Forrest's seed show wide variation in form and colour, ranging from pale blush-pink to a strong crimson-rose. Some of these plants are now 10 ft. in height. An outstanding form called "Trewithen Pink" received an Award of Merit from the R.H.S. in 1950. Unfortunately these wild forms of *C. reticulata* are much less hardy than the *Williamsii* hybrids.

It is clear that a certain element of chance has attended the introduction to cultivation of the Forrest species discussed above. In this respect his third introduction, *C. taliensis*, does not differ. It was actually first collected by Augustine Henry in Southern Yunnan in 1897, but although recognized by Cohen-Stuart as a probable new species, was not published as such until plants collected in 1912–13 by Forrest were described under this name by Professor Sir William Wright Smith. There is no record of any plants from the seed of these Forrest collections being in cultivation. At Exbury, how-



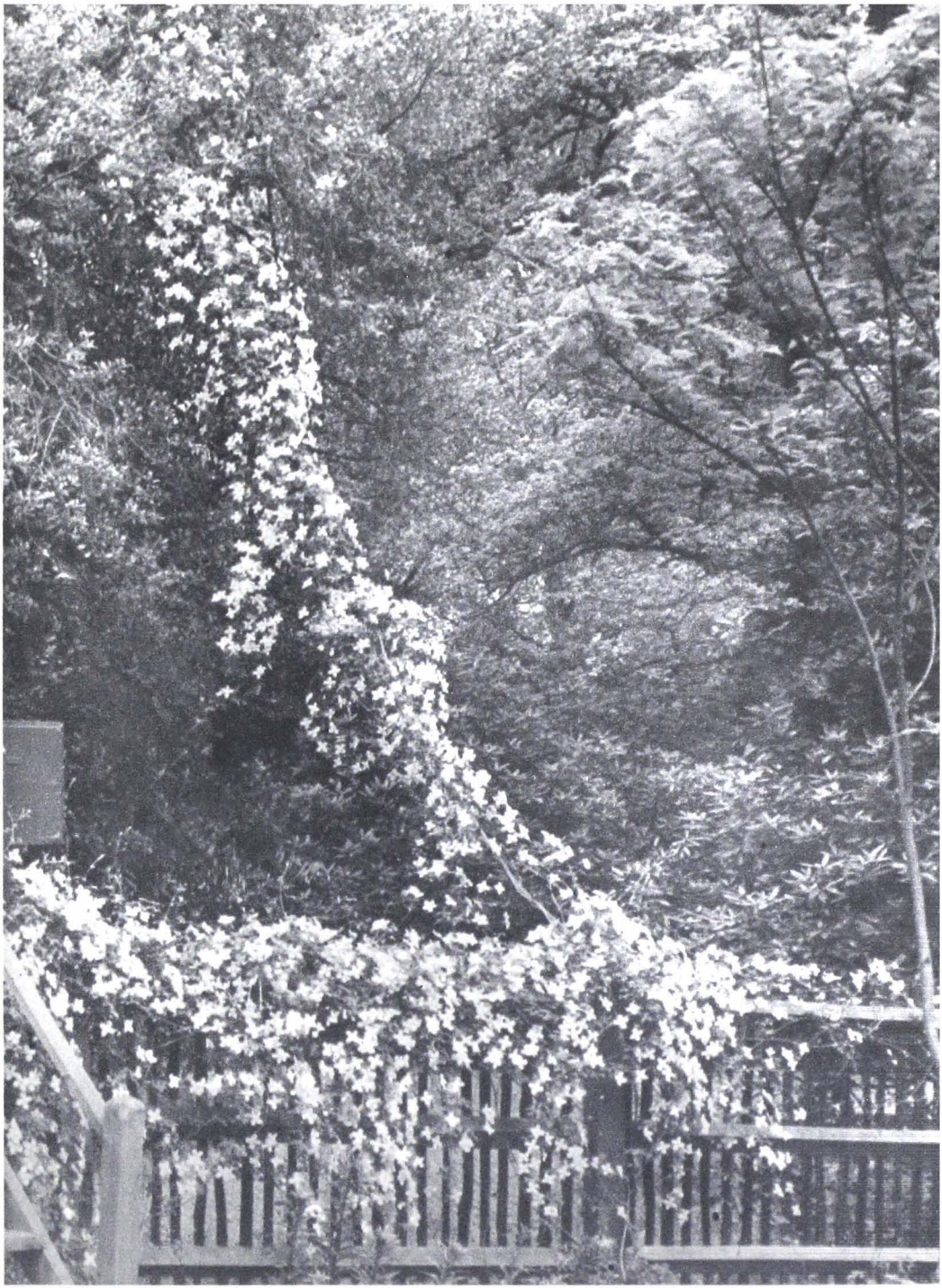
Photo, J. E. Downward

CAMELLIA RETICULATA 'TREWITHEN PINK'

ever, Mr. Hanger grew a plant from Forrest's seeds under the name *C. sinensis* which was afterwards recognized as *C. taliensis*. It is of interest to note that when the Rhododendron House at Exbury was bombed this plant withstood 20 degrees of frost and showed no sign of damage. When, however, in 1946 it became necessary to move the plant, it unfortunately died. The species is still in cultivation at Bodnant and Wisley from cuttings taken from the original Exbury plant.

Plants have been and still may be in cultivation under the name *C. Forrestii*. They have no connection, however, with the true *C. Forrestii* which Forrest collected on only one occasion, a flowering specimen taken from the Ch'u-hsiung Valley in 1903 during his first expedition in Yunnan. Cultivated plants bearing this name are merely forms of *C. saluenensis*.

Another delightful but, alas, little known species introduced by Forrest is *C. Tsaii* which has been flowered at Caerhays. It is upright in habit and its small white delicately scented flowers, resembling those of *C. cuspidata* but larger, are borne on the under side of the arching sprays, not unlike a Philadelphus. As far as we know it has not yet been grown outside Cornish gardens and it may well prove to be a tender plant in colder gardens, though it would well merit a trial.



Photo, J. E. Downward

CLEMATIS CHRYSOCOMA

In the Savill Garden, Windsor Great Park

CLEMATIS

In December 1912 on the western flank of the Shweli-Salween Divide in Yunnan in open situations at elevations of 7–8,000 ft. Forrest found a Clematis climbing on trees and scrub to a height of 20–30 ft. This species, which appeared to be new, was gathered again the following year, this time in immature fruit. Sir William Wright Smith described it as *Clematis Forrestii* (F. 9398 type). Seed from these 1913 gatherings was sent by Mr. J. C. Williams of Cornwall to the Royal Botanic Garden, Edinburgh. Forrest's plant was grown under this name until 1925 when Stapf (*Bot. Mag.* t. 9037) recognized that it did not represent a new species, but was no other than *C. napaulensis* which had been known for over a hundred years.

This had been originally collected by Francis Buchanan (later Sir Francis Hamilton) for Wallich early in the nineteenth century; later it was found by J. D. Hooker in Nepal, by Griffith in Bhutan and by Madden in Kumaon and British Garhwal. The slight difference in the Yunnan gatherings can well be encompassed within the concept of *C. napaulensis*, but Forrest's collections marked an important extension of its known range. It is a most attractive species with axillary clusters of creamy or greenish-yellow pendulous flowers with plumose styles that protrude beyond the purple stamens.

The Yunnan plants grown from Forrest's seed represent a reintroduction of the species, for as long ago as 1853 it was growing in The Royal Horticultural Society's Garden from seeds from an Indian source. This is confirmed in a report in the London Horticultural Journal of 1855 on the effect of the severe winter of 1853–54 on exotic plants. There is the brief remark "*C. Nipalensis* (sic) killed down to the ground, south wall, Chiswick". In Edinburgh *C. napaulensis* (Forrest's plant) was placed in the cool Rhododendron House where it grows freely and flowers profusely throughout the winter, fruiting in the spring. It is easily grown from seeds or from internodal cuttings made in July or August. Out of doors it is doubtfully hardy in any but the warmest parts of the country. In 1939 Mr. G. H. Johnstone of Trewithen received from The Royal Horticultural Society a Preliminary Commendation for *C. napaulensis* when it was exhibited as "a tender flowering shrub".

In February, when *C. napaulensis* is in fruit, *C. Armandii*, another Chinese introduction which grows easily in the Rhododendron House at Edinburgh, is bursting its flower buds. This evergreen species which commemorates the name of the Abbé Armand David, has white or creamy-yellow fragrant flowers and handsome dark green leathery foliage. Both Forrest and Wilson collected it repeatedly in Yunnan, but the Forrestian material differs from Wilson's in being much more free-flowering, though the individual flowers are smaller. Wilson introduced this species, which gained a First Class Certificate in 1914. In cultivation it likes a moist, well-drained soil and produces flowers in March or April and occasionally a second crop in August or September. One of the best garden forms of *C. Armandii* is known as "Apple Blossom".

Two other quite outstanding species which figure conspicuously in Forrest's collections, were originally found by the Abbé Delavay. This famous French missionary first gathered *C. chrysocoma* near Tali in 1882. Forrest found it on several occasions on the Li-chiang and Tali Ranges, in the Ma-chang-kai Valley in Yunnan and on the Nmai Hka-Salween Divide in N.E. Upper Burma, and discovered a new, much less hairy, leaved variety, var. *glabrescens* (F. 2246 type). *C. chrysocoma* was introduced to this country from France in 1910. It is comparatively easy of culture and can be propagated by cuttings made from nearly ripened wood. It earned the Award of Merit when exhibited by Mr. E. Markham in 1936.

C. ranunculoides is the other Delavayan discovery, made also near Tali in 1882. Forrest found it chiefly on the eastern flanks of the Li-chiang and Tali Ranges, on the Yung-pei mountains and on the mountains to the north-east of the Yangtze Bend, growing at altitudes of 6–10,000 ft. in dry grassy pasture and in thickets. He introduced it to cultivation in 1906. Other collectors have gathered it subsequently; Kingdon Ward collected seeds from limestone habitats at Muli in Sikang in 1921. *C. ranunculoides* with its deeply furrowed and angular stem is most variable; it may be an erect herb in the open, or a rambling under-shrub amongst hedges and shrubs. The leaves show all manner of lobing and dissection and the flowers are variable shades of rose, purple and violet. It is obviously a polymorphic species and is so treated by Handel-Mazzetti who regards as synonymous with *C. ranunculoides*, the following names, all based on Yunnan collections: *C. pterantha*, found by Henry in Ssu-mao; *C. Philippiana*, which Martin and Bodinier discovered around Lo-pie (Tchen-li-tcheou); and *C. Tenii* which Siméon Tén gathered at Pai-yen-ching. *C. ranunculoides* presents no cultural difficulties. Harrow, writing in the *New Flora and Silva* of 1929, says of it: "Planted at the foot of a greenhouse wall facing south, this species appears to be quite hardy. During the winter the stems die down to the ground level and are replaced the following spring by young shoots from the woody rootstock." It may of course be treated as a border plant or a climber. It has a long flowering period from May to September and has flowered in Edinburgh as late as the middle of November.

CODONOPSIS

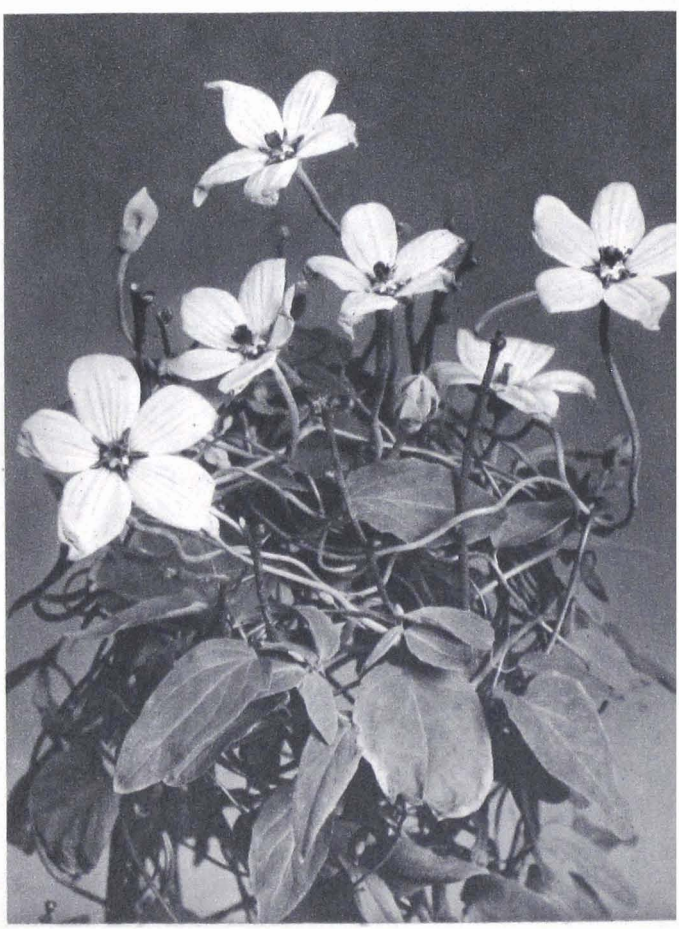
The campanulaceous genus Codonopsis has for long been familiar to serious cultivators of plants, though until a comparatively recent date only in the form of a very few of the species. Apart from the odour of the flowers, which is, to most people at least, unpleasant, there is some intangible quality about them which either interests or disinterests the horticulturist. Farrer, who had an eye for a plant, and frequently too enthusiastic a pen, gave them scant attention, as is evident from his account in *The English Rock Garden*. Forrest on the other hand was clearly attracted to them. He made abundant collections of 16 species, many of them new to science, and it is in large measure due to him that so many species have been, and still are, in cultivation.

The species readily fall into certain fairly natural groups. All workers on the genus are agreed in dividing it into two sub-genera. The first of these, *Pseudocodonopsis*, includes *C. convolvulacea*, *C. efilamentosa*—misleadingly named for it was originally described from immature material, and the stamens are not sessile as the name implies, but have filaments some 3 mm. in length—*C. rosulata* and *C. vinciflora*, all characterised by blue rotate corollas with almost free petals and a twining habit. Forrest gathered them all except *C. vinciflora* whose presence in cultivation today is due to the collections of Ludlow, Sherriff and Taylor. *C. rosulata* from Sikang and *C. efilamentosa* from Yunnan were both new to science, and the latter was in European culture for a very brief period. *C. convolvulacea* is now recognized to be a most polymorphic species with numerous expressions ocurring in a somewhat haphazard manner throughout the entire area of distribution in Yunnan and Sikang. One such expression, and a very robust one, with large, broad, mostly cordate leaves and flowers nearly 3 in. in diameter, is the plant which Forrest collected in Yunnan on the banks of the Yangtze at an elevation between 5–7,000 ft. in 1904 (F. 84 type), and which Diels described as *C. Forrestii*. The taxonomic status which must be given to these expressions—some with linear leaves, some with broad and large, some with hairy stems and leaves, some with glabrous—is in large measure a matter of opinion. Certainly they cannot be regarded as species. Nannfeldt, the present authority on this genus, would reduce all the names that have been given to them to the limbo of synonymy. The present writer is inclined to steer a middle course and to subscribe to the treatment of *C. convolvulacea*

CODONOPSIS
MELEAGRIS

Photo, R. M. Adam

CODONOPSIS
VINCIFLORA



Photo, J. E. Downward

by Ballard (*Bot. Mag.* t. 9581) who recognises all main variants from the type which seem morphologically distinct as varieties, and thus would name the lovely plant which bears Forrest's name, *C. convolvulacea* var. *Forrestii*. No doubt this is the plant which in 1922 was given the Award of Merit by The Royal Horticultural Society when exhibited by Mr. A. K. Bulley under the name of *C. tibetica*, and which was illustrated in the *Gardeners' Chronicle* and in *The Garden* for that year. Though *C. tibetica* is the name given to certain herbarium material in Kew and in Edinburgh, it appears to be an unpublished name only, and these particular specimens should be referred to *C. vinciflora*.

The second subgenus, *Eucodonopsis*, comprises a much greater assemblage of species, characterised by their tubular or campanulate corollas; they fall into two series. With series *Volubiles*—all twining species whose stems do not end in a flower and thus have unlimited growth, species such as *C. Henryi*, *C. lanceolata* and their allies—we are not concerned, for Forrest made no gatherings. Of series *Erectae*—the primary stems always bearing a terminal flower—Forrest gathered a rich harvest, thereby greatly extending the scope of the series, whose species conveniently may be divided into two groups.

C. tubulosa, *C. macrocalyx*, *C. chimiliensis* and *C. meleagris*, all have leafy or subscapose poorly branched or even unbranched stems with large leaves of variable size and shape and often more or less deeply incised. *C. chimiliensis* is restricted to the Nmai Hka-Salween Divide of N. E. Upper Burma. Though Forrest found the plant in 1924 and in 1925 and though F. 24887 forms the type of the species, Farrer actually discovered the plant on the Hpimaw Pass in 1919. Neither gathered seeds and thus this species has at no time graced our gardens with its pale creamy yellow purplish-veined flowers. *C. tubulosa* and *C. macrocalyx* have the same geographical range—N. E. Upper Burma and S. E. Tibet, Yunnan and Sikang. Both have setose stamens and a tubular yellowish-green corolla which may or may not be stained with purple at the base. But the corolla of *C. macrocalyx* is shorter and broader than that of its ally, wider at the mouth and much more constricted above the swollen base. Moreover, whereas the leaves of *C. tubulosa* for the most part are opposite, ovate-lanceolate, thick in texture and very shortly petioled, those of *C. macrocalyx* are larger, more or less triangular, flaccid, very glaucous below and are borne on long slender petioles. Both have been in culture, not necessarily from Forrest's seeds, and in spite of the obvious differences between them have been much confused. *C. tubulosa* appears to be much the more amenable for it has flowered regularly in the same spot in the rock garden in Edinburgh for the last thirteen years at least. More spectacular a plant is *C. meleagris* so named because of the strong likeness of the flowers to those of *Fritillaria meleagris*, terminal, solitary and pendulous and described by Forrest as "greenish-yellow, veined and marked lurid purplish-lake". He first met with it when collecting for Messrs. Bees Ltd. in Yunnan in 1916, in the grassy glades in pine forests and on the rocky slopes of the

eastern flank of the Li-chiang Range. In later years, he, as well as Rock and Schneider collected it repeatedly, on the same range and elsewhere so that its area is known to extend across the Yangtze Bend to the Chungtien Plateau and westwards to the Chiench'uan-Mekong Divide, at elevations of 11–12,000 ft. It was fairly frequently seen in gardens in the twenties and early thirties but now must be considered a rarity.

The rest of Forrest's gatherings are characterised by their more or less erect stems terminating in a pendulous flower, by the stems bearing many leafy branches and by the absence of radical leaves. The most common and best known species in cultivation, *C. clematidea*, is typical of the whole group. This species has a wide distribution in Turkestan and the adjacent regions, and of course was never collected by Forrest. Neither did he collect the beautiful Kashmir plant with which *C. clematidea* has so often been confused, *C. ovata*. But in S.E. Tibet he did discover 2 new species; *C. alpina* on the Dokar La in the Mekong-Salween Divide, in 1917, and *C. macrantha* in the Salween-Kiu-chiang Divide, in 1919. In N. E. Upper Burma, on the western flank of the Chimili, Nmai Hka-Salween Divide, he gathered *C. Farreri* in 1924. This also proved to be a new species though Farrer had collected it in the Chimili Valley (Farrer 1144) five years previously and had tentatively named it *C. Coxii*—a name which was never validly published. Cox, companion of Farrer on this 1919 journey, and in the best Farrer tradition, wrote of it thus: ". . . a fairy-like morsel with leaves as fine as a Maidenhair Fern, and bears an occasional drooping bell the size of a Canterbury Bell, but as thin in texture as goldbeater's skin, of a translucent yellow-green with lines of the purest violet, broad at the base and fining to the most delicate pencillings as they approach the tips. Here is no coarse being that flaunts its wares by the wayside. It clings to its shade, always retiring and never with more than six of its pendent luminous lamps on a plant. Even the pervasive foxy smell that places the Codonopsis among pigsty plants is faint and subdued. We searched for hours in October for seed, but only found one fertile pod, and this we lost, which was one of our minor tragedies." (Farrer's Last Journey, p. 113). Tragedy it was, for Forrest also failed to harvest seed and thus "the only worthy Codonopsis I have ever seen" has never been able to challenge the cultivator's skill—let alone his pen!

Two more species new to science Forrest discovered on the eastern flank of the Li-chiang Range. *C. subglobosa* he gathered in 1910 and soon afterwards Messrs. Bees cultivated it for a very brief period from his seeds. The same firm brought plants of his 1906 discovery, *C. Bulleyana* to the flowering stage in 1912, since which time this fine plant seems always to have been in culture, aided no doubt by fresh importations of seed. Forrest in later years met with it on the Dokar La in S. E. Tibet and both Rock and Kingdon Ward have recorded it also from the Muli Mountains of Sikang. The curious constricted corolla, or to quote once again the above author ". . . waisted in the middle, while the lower half of the hanging flowers

billow out like a ballet dancer's skirts", make it one of the most distinct species in the genus.

Culturally, these plants appear to present few or no difficulties. In a fairly acid loam in full sun or in partial shade, with good drainage in the winter months when there is danger of the tubers rotting, they are excellent plants for the rock garden, like the majority of their kin not objecting to lime. They are easily grown from seed, when this is fresh, and can also be propagated by cuttings. Perhaps winter protection in the form of a cloche is desirable, in the North at any rate.

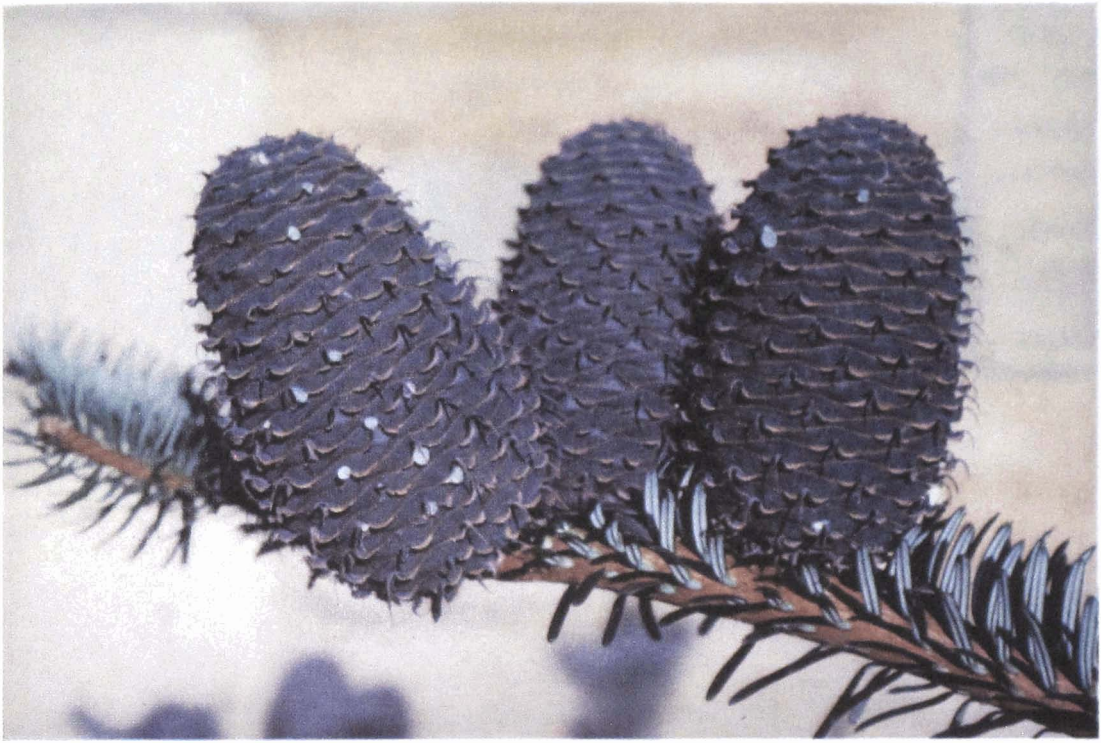
CONIFERAE

In the course of many journeys through Western China, Burma and Tibet, Forrest gathered a considerable amount of excellent material representative of many genera and species of the Asiatic Coniferae, some of which were new to science at the time of their discovery, while others had not been recorded previously from these regions.

That Forrest's conifer collection is a comprehensive one is evident from the nature of its components for it comprises all but four of the species known to occur in W. China, or its borders, and these are found in localities not explored by Forrest. It is not possible within the space prescribed to give a detailed enumeration of all the conifers found by Forrest, but it can be claimed that by his efforts in the field our knowledge of the coniferous flora, and its distribution in the areas visited by him, has been enormously increased.

In Coniferae Forrest's most noteworthy find is undoubtedly the Silver Fir which bears his name, and which is now one of the most ornamental conifers in cultivation. *Abies Forrestii* (F. 6744) was discovered on the Li-chiang Range, N. W. Yunnan, in 1910, and was found again in 1922 on the Chiench'uan-Mekong Divide, some seventy miles south-west of the type locality. In its native habitat, this species attains a height of 130 ft., and forms pure forest, or occurs intermixed with larch and pine, at altitudes up to 12,000 ft. *A. Forrestii* has been found nowhere else in W. China and is apparently endemic to Yunnan. It is distinguished in cultivation by its assurgent foliage; the upturned leaves on both sides of the shoots expose their snow-white under surface. According to Forrest, this arrangement of the leaves is a seasonal phenomenon in native trees; it becomes obvious at the approach of winter, and disappears in the spring. With rusty-red branchlets, large white buds and upturned foliage *A. Forrestii* presents an appearance which has rightly earned for it the title "King of Silver Firs".

Abies Georgei, another of Forrest's discoveries, found associated with *A. Forrestii* on the Chiench'uan-Mekong Divide, is closely allied to the latter, but differs from it in the branchlets, which are thickly covered with a reddish pubescence, and more markedly in the cones which have bracts of such an unusual size and shape that the adjacent cone scales are almost entirely obscured. This more recently introduced species is in cultivation in several parts of the country, and is reported to be growing remarkably well



Colour Photo, F. N. Wyatt

ABIES FORRESTII,
a native of the Li-chiang Range

on the chalk in the south of England. Whether or not *A. Georgei* will remain true to type in cultivation has yet to be seen. The characters which separate certain of the Chinese Silver Firs are prone to change in successive generations—perhaps as a result of hybridisation—and claims to specific rank may require to be reviewed in the light of experience.

Other conifers recorded from Yunnan for the first time by Forrest are *Podocarpus Forrestii* (F. 4665 type), *Pseudotsuga Forrestii* (F. 13003 type), *Tsuga Forrestii* (F. 17169 type) and *Tsuga dura* (F. 6747 type).

Podocarpus Forrestii is apparently confined to the Tali Range where it was found in 1906, growing in the shade among scrub. It is a shrubby species, closely akin to *P. macrophyllus* var. *maki*, from which it differs mainly in the colour, form and texture of the leaves. This new *Podocarpus* does not appear to be in cultivation. *Pseudotsuga Forrestii*, another conifer with a restricted distribution in the alpine regions of N. W. Yunnan, was discovered in the valley of the Mekong in 1914. Some authorities have expressed the opinion that Forrest's Douglas Fir is identical with *Pseudotsuga Wilsoniana*, a native of Formosa, but there is no doubt that *Pseudotsuga Forrestii* is specifically distinct from the latter, and to Forrest belongs the credit of its discovery and introduction. Unfortunately, it has not proved truly hardy in cultivation, more particularly in Scotland.

The two new Hemlock Firs which came from the stupendous gorge which cleaves the Li-chiang Range in two have been described by Forrest as trees of 80–90 ft. in height, growing in association with *Larix Potanini*, and the graceful *Pinus Armandi*. *Tsuga Forrestii* most closely resembles *T. chinensis*, while *T. dura* is more nearly akin to *T. yunnanensis*, the character of the cone supplying the differentiating mark of the species in each case. Latterly the validity of these new species has been questioned, and it has been suggested that they are no more than local variants of the older species to which they are allied.

Some interesting facts relative to the geographical distribution of certain Asiatic conifers have been brought to light through Forrest's discoveries. The finding of the Sikkim Larch on the lofty mountains that straddle the Burma-Yunnan frontier is a case in point. The occurrence of *Larix Griffithii* in this isolated region, remote from the Himalayan habitat, presents a problem in migration not easy to explain. A parallel case is afforded by the presence of the Himalayan Yew, *Taxus Wallichiana*, in N.W. Yunnan, confirmed by Forrest's specimens from the Dokar La on the confines of Tibet. In this case, however, a connecting link has been established by Kingdon Ward's discovery of the Himalayan Yew in the Tsangpo Gorge.

Still more remarkable is the existence in Yunnan of the rare Formosan conifer *Taiwania cryptomerioides*. This far-travelled immigrant was found originally on the Salween-Irrawaddy watershed, and its discovery in this extreme north-west corner of the province is shared by Handel-Mazzetti and Forrest. Unfortunately, the first specimens collected by Forrest, together

with other valuable material, were lost at sea through enemy action in the first world war. It is gratifying to record that the missing specimens of *Taiwania* were replaced at a later date by others from the same locality. *Taiwania* is now known to occur in Burma also, and the fragrant timber of this tree, as well as that of *Juniperus Coxii*, has long been exported to provide the "coffin-wood" so much prized by the Chinese. Some time ago, material of *T. cryptomerioides* from Yunnan was made the basis of a new species, *T. Flousiana*, but an examination of the relevant material makes it clear that undue importance has been attached to minor points of difference such as might be expected to arise in a geographical form of a wide-ranging species. The enigma of discontinuous distribution raised by the occurrence of this Formosan conifer in Yunnan and Burma, and nowhere in between, still remains.

One other record established by Forrest is worthy of note. This relates to the discovery of *Cephalotaxus Harringtonia* var. *sinensis* in Yunnan, where it is restricted to two localities, both in limestone areas. The apparent scarcity of this Chinese variety of the Japanese Plum Yew in Yunnan is remarkable since it is of frequent occurrence in similar situations in the neighbouring province of Szechwan, as well as in Hupeh.

Of the better known genera, *Abies*, *Picea* and *Pinus*, there is ample material in Forrest's collection, all indicative of an acute power of discrimination in the choice of typical examples of the Chinese species. Nor did Forrest neglect to gather seed from those found in cone, often in hazardous circumstances, and numerous fine specimens of Chinese conifers in cultivation are living emblems of his achievements in the field. The most successful of his earlier importations are *Abies Forrestii* from the slopes of the Li-chiang Range, and *Picea likiangensis*, the common spruce in the upland valleys of N. W. Yunnan, where trees of 150 ft. in height are not uncommon. Hardy specimens of both species, grown from seed of Forrest's gathering, are now reaching maturity in many parts of the British Isles. The last consignment to be despatched, shortly before the tragic ending to his final expedition in 1932, contained the seed of *Pinus yunnanensis*, *Tsuga yunnanensis*, *Keteleeria Davidiana*, *Abies chensiensis* and *Abies Delavayi*, the last-named from the *locus classicus* on the Tali Shan, where Forrest had collected his first conifer in 1906.

In W. China, not a few of the Coniferae observed by Forrest on his journeys have been cultivated by the inhabitants from time immemorial, and some are of considerable historical interest. As symbols of immortality these are found chiefly in the vicinity of shrines and temples, and but rarely in a wild state, being doubtfully indigenous. The Maiden Hair Tree, *Ginkgo biloba* is perhaps the best-known of these "trees that whisper round a temple". There amid sacred surroundings, fostered by the priests, this survivor of an ancient race of world-wide distribution makes its last stand against the ravages of time. Forrest's specimens of *Ginkgo biloba*, taken from trees of 90 ft. in height, are in an excellent state of preservation.

Other familiar conifers, planted by Buddhist monks in similar situations, also find a place in Forrest's extensive collection. Included among these are the graceful and slender branched *Cupressus Duclouxiana*, seed of which was sent home by Forrest; *Cryptomeria japonica*, of Japanese origin, named by the Chinese "Goddess of Mercy Fir". *Thuja orientalis*, the Chinese "Arbor-vitae", unlike the foregoing is possibly a native of Yunnan, which in more spacious times often graced the gardens of princes and was planted round the tombs of emperors.

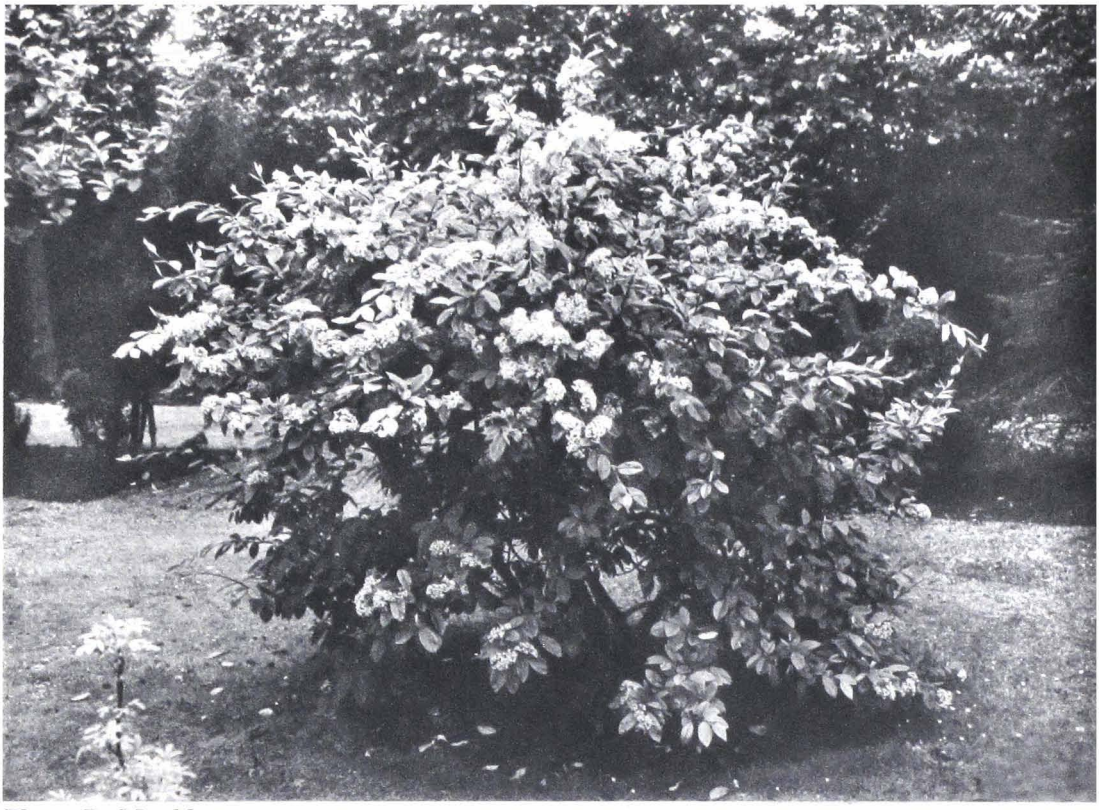
COTONEASTER

To the systematist, Cotoneaster is by common consent one of the most troublesome genera of flowering plants. The material of many so-called species is very incomplete; some species are intensely variable; some appear partial to hybridity; some are possibly apomictic. In view of our present knowledge, therefore, it seems rash to attempt an accurate estimate of the number of true species Forrest collected. It can however be said that among his numerous Cotoneaster gatherings, as the record now stands, the following are new additions to the genus: *C. insculpta* (F. 800 type) from the Salween Valley, *C. verruculosa* (F. 4427 type) from the Tali Range, *C. glomerulata* (F. 12046 type) from the Shweli Valley, *C. lactea* (F. 10419 type) gathered on the descent to the Yangtze from the eastern boundary of the Li-chiang Valley, a robust state of *C. pannosa*, 2 varietal states of a very floriferous form of *C. glaucophylla*, as well as *C. hebephylla* (F. 283 type) from the Chungtien Plateau and several deviations from the type plant, the most important of which is known as var. *monopyrena* (F. 11422 type) from the Li-chiang Range.

Three of these new plants, *C. lactea*, *C. hebephylla* and its variety *monopyrena*, as well as the free flowering form of *C. glaucophylla*, he introduced to British gardens. The latter plant raised under the number F. 6754, was at first called *C. serotina* and was figured under that name in the *Botanical Magazine* (tab. 8854) of 1920. But nine years later in the same journal (tab. 9171), Dr. Stapf, in a well argued statement, rightly concluded that Forrest's plant should be regarded as an unusually floriferous and late flowering form of *C. glaucophylla*, an evergreen shrub of some 10 ft. with the young shoots and the lower surface of the leaves at first markedly downy but later often quite smooth, with corymbs of white flowers and bright red fruits. Delavay discovered it in 1884 near Hoking, a town on the road from Tali to Li-chiang and in close proximity to the locality where Forrest gathered the seeds in 1910 from which *C. serotina* was raised in Britain.

C. lactea, a handsome shapely evergreen shrub up to 15 ft. high with milky white flowers and pear-shaped red fruits nearly one quarter of an inch long, was discovered by Forrest in 1910 and is confined apparently to a small area of the Li-chiang Range and the Chiench'uan-Mekong Divide. Closely allied to *C. Henryana* and *C. salicifolia* it is readily distinguished by the obovate leaves, long-cuneate at the base.

C. hebephylla and the large dark-red or almost black-fruited variety, which has the two pyrenes united into one, have been in cultivation for upwards of thirty years and yet are by no means as common in gardens as they deserve to be. Both are most graceful deciduous shrubs, sometimes 10 ft. or more tall, with almost round bristle-tipped leaves, and unlike many members of the genus are equally attractive whether in flower or in fruit.



Photo, R. M. Adam

COTONEASTER LACTEA

Photo, G. Forrest

CYANANTHUS LEIOCALYX

CYANANTHUS

Of the charming genus Cyananthus, which is so highly esteemed among rock garden plants, no fewer than seventy-one specimens are in Forrest's herbarium and these represent thirteen different species and nine distinct varieties. Unfortunately some have never been successfully introduced to cultivation and others that were have since been lost.

C. Forrestii (F. 955 type) discovered in 1903 in open grassy situations on lava beds in the Ning Kwang Valley, has the distinction of growing at the lowest elevation—6–7,000 ft. at which any Cyananthus is found, though there is little else to commend it. Not so *C. formosus* (F. 2726 type). This magnificent plant, perhaps the most beautiful of all, was discovered by Forrest in 1906 on limestone drifts on the eastern flank of the Li-chiang Range. It grows in great mats with deep blue tubular flowers 1–1½ in. in length. In the *Bulletin of the Alpine Garden Society* (146, 1930–32) it is described as "one of the most enchanting of Alpine plants, admirable in colour and form, an excellent plant for the Rock Garden". It, alas, is one of those which have disappeared from cultivation. A similar fate befell *C. lichiangensis* (F. 6369 type). This attractive plant, with light yellow, not blue, flowers, was found by Forrest in August 1910, on the western flank of the Li-chiang Range where it grew in Rhododendron scrub.

Less outstanding as garden plants but none the less worthy of mention are *C. fasciculatus* (F. 22485 type) and *C. flavus* (F. 2530 type), both also from the Li-chiang Range. We owe to Forrest all the species which have been mentioned above as well as the following new varieties: *C. Hookeri* var. *densus* (F. 14847 type); var. *grandiflorus* (F. 22477 type); *C. inflatus* var. *sylvestris* (F. 11343 type) and *C. macrocalyx* var. *flavo-purpureus* (F. 14514 type).

The plant illustrated, *C. leiocalyx*, was introduced by Forrest in 1905; it was given an Award of Merit in 1916 and survived in gardens at least until the beginning of the war. This species and some others mentioned, together with *C. formosus* which was often in Forrest's seed collections, are plants we should all wish to see re-established or successfully introduced to cultivation.

Photo, Angus Barber

CYNOGLOSSUM AMABILE

CYNOGLOSSUM

Stapf and Drummond's naming and describing of *Cynoglossum amabile* in 1906 was based partly on Yunnan material collected by Hancock at Mengtsze in 1884 and by Henry at Ssu-mao in 1896–97, and partly on Szechwan material gathered near Tatsienlu by Soulié in 1893 and by Pratt about 1889–90. From one of these sources Max Leichtlin probably obtained the seeds from which he raised the first plant in cultivation. It seems more than probable that its present existence in gardens is due in large measure to seeds sent home by Forrest, who collected this plant on the Li-chiang and Tali Ranges and in the Yung-ch'ang Valley, at altitudes of 6–10,000 ft. on both dry and moist pastureland.

From its behaviour in cultivation it has been variously labelled annual, biennial or perennial, but the modern tendency is to treat it as a half-hardy annual. It may flower the first year if seeds are sown early in the year, a practice which is quite common. When grown as a biennial the flowers are displayed earlier. If so desired, a longer flowering season can be obtained by treating the species both as annual and as biennial.

No matter how it is treated, there is no disputing the charm of this Chinese Hound's-tongue. When grown in large patches, the beautiful sky-blue flowers are seen to best advantage in association with other plants, for instance as one writer has suggested, with Montbretias or Roses.

The new species found by Forrest, *C. triste*, with deep crimson almost black flowers, is very distinct from *C. amabile*. The ovate cordate leaves up to 3½ in. broad are spattered like the stem with golden-yellow bristly hairs, which impart a sheen to the plant. Forrest first saw it in 1906 on the Li-chiang Range and later on the Chungtien Plateau, and Rock has since extended its range into S. W. Szechwan, where he found it on Mt. Nub-tsi-ga. *C. triste* has never been in cultivation.

Despite the many times he traversed the Li-chiang Range Forrest collected *C. glochidiatum* only during his first journey. Even so, this isolated record is most important in that it represents an extension in the area of distribution of this species which ranges wide from Central Asia, through Afghanistan, Kashmir, Tibet, Assam and Central and Southern India.

From Yunnan he also gathered *C. lanceolatum* subsp. *eulanceolatum* and *C. zeylanicum*, both inhabitants of open stony pasture. The latter plant was grown by Mr. W. Bain, and exhibited by Sir Trevor Lawrence in 1903, but no further record of its cultivation is to be found.

DAPHNE RETUSA

Photo, "Country Life"

DAPHNE

In an address to The Royal Horticultural Society in 1915 Forrest described *Daphne aurantiaca* as one of the most beautiful free flowering shrubs in W. Yunnan. This is high praise when one considers that the flora of this region is one of the richest in the world and has for many years provided our gardens with large numbers of outstanding plants. The free flowering habit of the Daphne and the superb quality of the flowers, orange-yellow and fragrant, make it a plant worthy of a place in any rock garden, a fact recognised by The Royal Horticultural Society in 1927 when *D. aurantiaca* was awarded a First Class Certificate.

It has never been a common plant in cultivation and indeed at present must be regarded as a rarity. Most growers have found it a somewhat intractable subject, perhaps for the reason that the conditions under which it thrives in its native habitat have not been sufficiently well known and emulated in cultivation. Forrest collected the type (F. 2115) in 1906 on the limestone cliffs of the Li-chiang Range, "clinging to ledges and smothering the slopes in the stoniest situations". It is thus a limestone plant and must be treated accordingly if it is to flourish in our gardens.

Forrest made several collections of this species not only in Yunnan, but in Szechwan as well; two of these gatherings were named *Daphne calcicola*, now regarded as a growth form of *D. aurantiaca*. Although *Daphne aurantiaca* occupies a somewhat isolated place in the genus, there seems little justification for its transference to the genus Wikstroemia as was done by Domke in 1932. Stapf (*Bot. Mag.* Vol. 156. Tab. 9313) has shown that it occupies just as isolated a place in Wikstroemia as in Daphne.

Much more familiar is another species which Forrest found on the same expedition, the large berried and rose-pink-flowered *Daphne retusa*, which provides a wealth of fragrant bloom in late spring. It is a compact, densely branched plant with handsome, glossy, deep green foliage, which persists through the winter. An almost equally well known, although because of its less hardy nature not so popular a plant, *Daphne odora*, was also collected by Forrest. It is a tender evergreen shrub with dense clusters of fragrant flowers tinged purple.

In addition, he made collections of 6 species of the closely allied genus Wikstroemia—*W. dolichantha* (F. 133 type), *W. holosericea* (F. 13 type), *W. leptophylla* (F. 11230 type), *W. mekongensis* (F. 13079 type) and *W. scytophylla* (F. 44 type). It is also worthy of record that the beautiful, though rather rare, *Stellera chamaejasme*, close ally of Daphne, also figures in his collections.

Photo, G. Forrest

DELPHINIUM LIKIANGENSE

DELPHINIUM

The genus Delphinium is widespread over the Northern Hemisphere but there are also several species south of the Equator. Of the four hundred species about ninety are found in China. The genus was monographed by Huth in 1895 and a later study by Earle I. Wilde in 1931 is excellent both from botanical and horticultural standpoints.

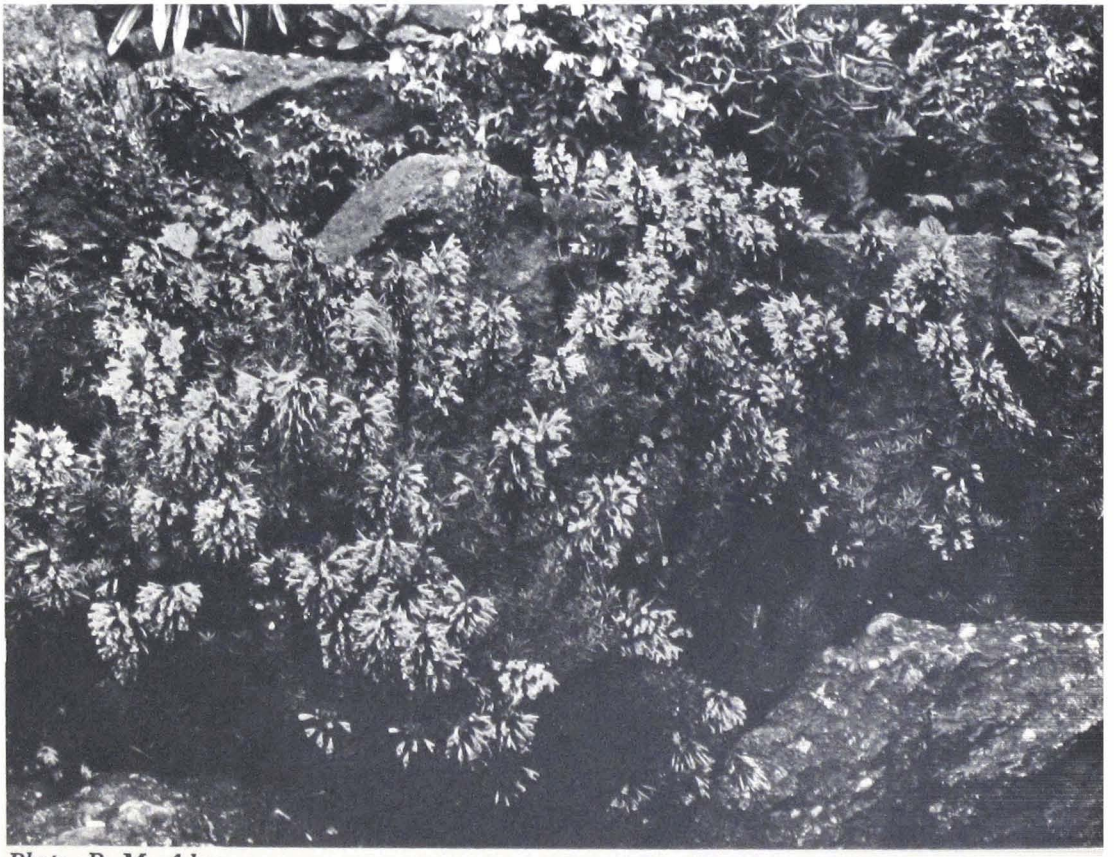
From Yunnan and Szechwan Forrest collected 17 species of which 6 were new to science. Some of these are fairly tall plants: *D. Bulleyanum* with deep purplish-blue flowers and one of the few Chinese species in cultivation, the blue-flowered *D. Georgei*, *D. pediforme*, so named from the resemblance of the spur to a shepherd's crook, and the beautiful *D. Forrestii* with its stout raceme of flowers varying in colour from deep purple to a transparent watery-blue covered with white hairs on the outside. All are suitable for the herbaceous border.

Of the other 11 species which had previously been found by others and of which he gathered over ninety specimens, some are most beautiful dwarf plants eminently suited to the rock garden and scree. One of these is *D. likiangense* which had been previously discovered in 1886 by the Abbé Delavay, who added many new species to the genus. Forrest first secured it on the eastern flank of the Li-chiang Range at 11–12,500 ft. in September 1906 and frequently during his later expeditions. *D. likiangense* is also outstanding in that it is one of the few species which are fragrant and for this reason is a very desirable plant for the rock garden.

Delphinium likiangense in common with *D. yunnanense*, *D. ceratophorum* (both of which Forrest collected) *D. Beesianum* and *D. calcicola* is a scree lover, flourishing in barren open situations. In its natural habitat it is found on limestone rubble, on cliff ledges and in open stony pasture at altitudes of 11–14,000 ft. It is a tufted hardy rock garden plant which requires little soil. It may attain 2 ft. in height, but is usually less than a foot; it bears 3–5 magnificent light blue blooms on erect scapes rising high above an abundance of finely divided dark, glossy green leaves. The flowers are unusually large for the genus being 2 in. or more long including the spur, and 1–1¼ in. broad. The sepals are longer than the spur, an uncommon feature which this plant shares with the Chinese *D. pachycentrum* and with the two Himalayan species, *D. Brunonianum* and *D. cashmerianum*.

Photo, G. Forrest

DESMODIUM PRAESTANS
in the Mekong Valley



Photo, R. M. Adam

DRACOCEPHALUM FORRESTII

DESMODIUM

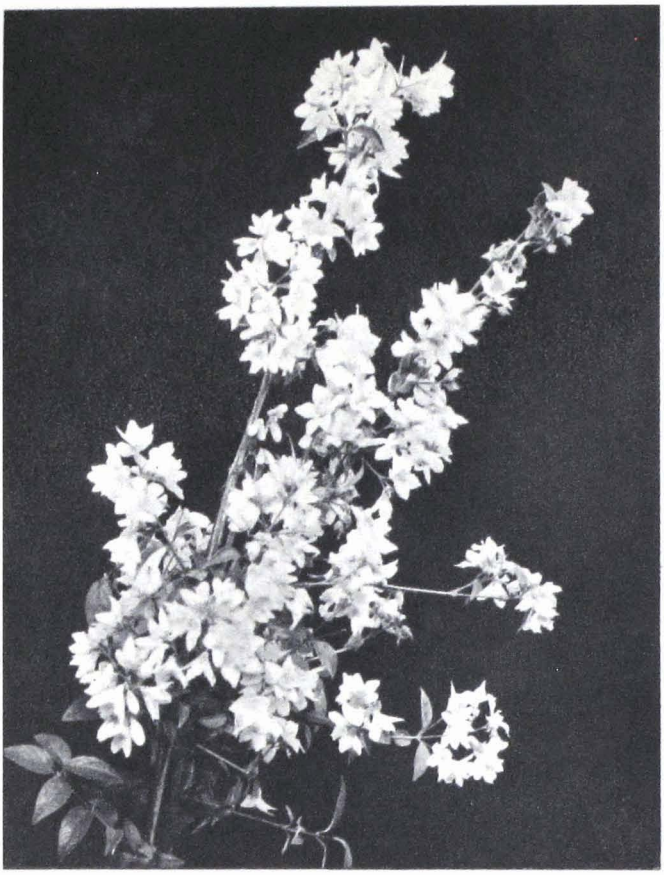
The flora of Western China is relatively rich in representatives of the genus Desmodium, and upwards of a score of species have been recorded by Forrest from various localities in Yunnan, and several from across the border in Burma and Tibet. Some of these by their presence in Yunnan show that the area of their distribution is greater than was at first supposed, for species such as *D. floribundum*, *D. Griffithianum* and *D. tiliifolium* found by Forrest in Yunnan, were first described from specimens collected in the Himalayas. This perhaps is but another case among many of infiltration by species not truly native, which gives the flora of Yunnan its composite character, and has made this corner of China a plant-hunter's paradise.

Two of the many species of Desmodium found by Forrest proved to be entirely new, and one of these, *D. praestans* (F. 13096 type), described from specimens gathered in the Mekong Valley in 1914, has now been in cultivation for a number of years. Additional material of this new Desmodium was obtained by Forrest from localities further west on the Chungtien Plateau, and also from the mountains north and east of the Yangtze Bend.

In its native habitat, where it favours rather dry and open places on the margins of thickets, *D. praestans* is a strong-growing shrub of spreading habit and attractive appearance. The flowers, borne on terminal panicles, are of a bright purple blue and form a colourful contrast to the silvery-grey foliage. This striking species has proved its worth as a decorative plant in the south of England, where it has flourished and flowered in favourable situations, as at Windsor and Wisley, but it requires a sunny position, preferably against a wall. In Scotland, *D. praestans* is less hardy, and in the open at Edinburgh it failed to survive the severe winter of 1940–41.

The second *Desmodium* discovered by Forrest in Yunnan came from the Tali Range in 1906, and has been named *D. Forrestii*. It is a low-growing, shrubby species with flowers of a purplish-rose colour, and is not so striking in appearance as *D. praestans*, nor is it so well known.

Other interesting species found by Forrest in Yunnan include *D. gyrans*, the so-called Telegraph Plant, and two discovered originally by the Abbé Delavay in 1887–88, *D. cinerascens* and *D. callianthum*. Further afield in Upper Burma, material of *D. karensium*, *D. oblatum* and *D. polycarpum* were added to his already large collection of Desmodium species from W. China, comprising some seventy specimens in flower or fruit.



DEUTZIA
MONBEIGII

Photo, R. A. Malby

GAULTHERIA
FORRESTII

Photo, G. Forrest

DEUTZIA

The genus Deutzia is among the most valuable of garden flowering shrubs and is of great value for forcing and for a display in the summer months.

Forrest's collection of Deutzias covers a wide number of species and while most of these had been collected previously by others, we are indebted to him for the introduction of *Deutzia Monbeigii* into this country. It was first collected by Monbeig at Tseku in N. W. Yunnan in 1912 but was not brought into cultivation until 1917 when Forrest collected seed of it at 10,000 ft. in the Weisi Valley, Yunnan. A graceful shrub of from 4–6 ft., it carries numerous cymes of over a dozen flowers in the axils of the leaves. These blossoms are white and are often tinged with green on the exterior of the petals. While it has not been so free flowering in the North, it has been very attractive in the South.

There were many collections made of *D. longifolia* and *D. purpurascens*. The former, gathered on almost every expedition in Yunnan in the region from 6–11,000 ft., has flowers varying in colour from creamy-white to white tinged purple. The other, *D. purpurascens*, was found at similar altitudes in Yunnan, Upper Burma and Tibet. This species has a wide distribution and varies in colour from creamy-white to pale rose-purple, the reverse of the petals being flushed purple.

Deutzia Rehderiana was discovered, named and described by Schneider. About the same time Forrest also collected it but his plant was named *D. dumicola*, a name which has had to be reduced. It is described as a plant of 4–6 ft. in height, greyish in colour, with pure white flowers produced in fine flowered cymes.

Previously known as a variety of *Deutzia corymbosa*, *D. Hookeriana* would appear to be almost as widespread in China as in the Himalayas. Forrest met with it several times in Yunnan and Upper Burma growing among scrub between 8–10,000 ft. It is a plant 2–6 ft. in height with white flowers flushed purple on the exterior.

Other species which figure in Forrest's collections include *D. calycosa* and the variety *macropetala*, both of which were found in Yunnan in open situations and among boulders on cliffs at 9–10,000 ft.

DRACOCEPHALUM

Forrest's Dracocephalum collections were of outstanding value from two main points of view; they brought to European gardens several new horticultural plants of great merit and they solved problems concerning the relationship of the Chinese species.

Up to 1910 reputable authorities on the flora of China such as Professor Diels and Mr. Dunn had concurred in the view that *D. tanguticum*, found by Przewalski in Kansu, was distributed not only in Kansu but in Szechwan and Yunnan as well, and that it could be separated readily from its Chinese allies by its pinnatifid leaves. Thus all plants with pinnatifid leaves, including those of Forrest's first expedition, were named *D. tanguticum*. However Forrest's collections from 1910 onwards were to prove that *D. tanguticum* of authors subsequent to Maximowicz was an aggregate species containing several very distinct plants meriting specific rank.

One such plant, which Diels had named *D. tanguticum*, was collected in 1904 on the Chungtien Plateau and in 1906 and in 1910 on the Li-chiang Range. Though the foliage bears a striking resemblance to that of the Kansu plant, the flowers are very different. They form a truss 3–6 in. long carried on 12–18 in. stems, are deep purplish-blue, an inch in length and thus much longer and brighter coloured than those of *D. tanguticum*. This Yunnan plant was very properly named *D. Forrestii* in 1916. Another plant of the same alliance, *D. calophyllum*, was discovered by Handel-Mazzetti on the Dokar La in 1915, and by Forrest in the same locality two or three years later. So great is the similarity between the flowers of *D. Forrestii* and *D. calophyllum* that the latter plant was distributed and grown under the name of the former. In habit, however, the two are distinct with *D. calophyllum* having broader, less markedly reflexed leaf segments.

Still within the same alliance is *D. propinquum* a bushy plant 12–18 in. high with flowers of soft violet-purple. The type (F. 11195) Forrest gathered in the mountains N.E. of the Yangtze Bend in September 1913, the month after he had made his only gathering of *D. taliense* Forrest (F. 11524 type) on the western flank of the Tali Range. Both are small-flowered species and neither can compare as garden plants with the showy *D. Isabellae* (F. 12789 type) discovered on the Chung-tien Plateau (the home of *D. Forrestii*) in 1914 and named after his sister Miss Isabella Forrest. The large rich violet-purple flowers subtended by the richly coloured bracts blend happily with the finely cut greyish-green foliage, making *D. Isabellae* a most distinguished plant.

Quite outside the aggregate of *D. tanguticum* and its allies is Forrest's other important addition to the genus, *D. bullatum* (F. 2730 type), discovered on the Li-chiang Range in 1906 and introduced a few years later. With long stalked orbicular cordate leaves, stout purplish flowering stems and large bluish-violet corollas darker spotted on the lower lip, it is a very distinct and useful plant for the rock garden.

GAULTHERIA

Although *Gaultheria Forrestii* is one of the most ornamental species of this delightful and popular genus, it has never been widely cultivated. It was discovered in 1906 on the eastern slopes of the Tali Range by Forrest during his first exploration of Yunnan and Tibet. There it grew in moist, open situations amongst scrub and rocks at altitudes between 10–12,000 ft. Professor Diels described it as a species in 1912.

It is a small, branching, evergreen shrub, two or three feet in height, with colourful red wood. The pure whiteness of the scented flowers is enhanced by the white flower-stalks, the whole inflorescence contrasting with the bright green leaves to give an effect of great beauty. Even in autumn the plant is decorative, when the globular fruits, which persist on the bush till December, turn lilac-purple and finally a vivid china-blue.

A controversy has arisen over the true identity of *Gaultheria Forrestii*. The plant growing in Mr. G. Johnstone's garden at Trewithen which won The Royal Horticultural Society's Award of Merit in 1937, had superb, waxy white inflorescences but was not outstanding as a berrying plant. The plant shown by Robert Veitch and Son in 1927, which also won an Award of Merit, while less conspicuous in flower, had clusters of brilliant porcelain-blue berries. This, however, was probably *G. tetramera*.

There is also a Gaultheria plant at Exbury which is poor in flower but which bears heavy clusters of "milk white fruit tinged with pale blue, which later turn to plum colour". Mr. F. Hanger believes this plant to be *Gaultheria tetramera* but Mr. Airy-Shaw says this free-berrying form is nearer *G. Forrestii* than anything else. This confusion seems likely to persist until a thorough systematic revision of the group is undertaken.

Gaultheria Forrestii is not difficult to grow in this country; it appears to be fairly hardy and is particularly successful in the South. Like most Ericaceae, it prefers peaty soil or light vegetable mould which is moist but well drained and free of lime. An occasional thin mulch of leaf-mould is helpful. It can stand more sun than most Gaultherias, but some shade is advisable in the South and it does not thrive in exposed positions.

Propagation is by offsets or seeds. It spreads slowly by underground runners and is checked by any root disturbance. However, this easily grown plant which is such a colourful sight from the summer months on through autumn till December deserves to be grown more widely.

GENTIANA

Throughout all his journeys, Forrest showed a keen interest in the genus Gentiana and he collected many hundreds of specimens of which a vast number were new species and new varieties. There is no doubt that his interest in this group must have been aroused by his early finding of *G. sino-ornata* (F. 408 type) in 1904, although it was not until the later expedition of 1910 that it was brought into cultivation. This species will always be associated with Forrest's name and as a garden plant it ranks as one of his finest introductions. In 1910 *G. sino-ornata* was really a new plant. There was no other of the same section in cultivation although some had been collected, such as the Himalayan *G. ornata*, and the two plants found by Soulié in W. Szechwan, which were considered varieties of *G. ornata*.

Forrest first collected *G. sino-ornata* at the summit of the Mi Chang Pass between the River Yangtze and Chungtien Plateau at altitudes between 14–15,000 ft. In 1910 when he collected it again, it was at a lower altitude on the Li-chiang Range. Plants raised from Forrest's seeds first flowered in 1912 at Ness and the Royal Botanic Garden, Edinburgh and qualified for an Award of Merit in 1915. At that time *Gentiana ornata* was the only species of that section known and Forrest's plant was designated *G. ornata* "Chinese Form", and remained under this name until the species was described in 1918 by Balfour.

Gentiana sino-ornata is too well known to need a full description here but it may be said that because it is free flowering late in the season and is easy to propagate it has become a very popular plant. It has been of value to the hybridist and is the parent of several worthy hybrids. In addition to the typical form Forrest also collected several varieties of *G. sino-ornata*. In the same year that he discovered the type, he found a white form which was later named var. *alba*. Many years later, in 1922, he found the var. *punctata*. The most outstanding variety was given the name var. *gloriosa* (F. 20640 type), and well deserves the name. It is a magnificent plant; the flowers are of a clear blue, over 2½ in. in length. Although more than one collection was made, in S.W. Szechwan, by streams in the Muli Mountains and on the mountains east of Yungning at 12,000 ft., this variety has never been raised in cultivation.

Another plant closely allied to *G. sino-ornata*, which may be a variety of that species, was found at Lei-beng Shan and named *G. heliophila* (F. 15187

GENTIANA SINO-ORNATA

From a coloured drawing by Miss L. Snelling
in "Curtis's Botanical Magazine", t. 9241

type). It differs from *G. sino-ornata* in its dark purple flower with larger corolla and calyx lobes.

Two other species of this series which Forrest collected, were *G. oreodoxa* and *G. ampla*. The former is a tiny plant with wide open flowers from the Mekong-Salween Divide and the latter, which Forrest found on the eastern flank of the Li-chiang Range, is a dwarf compact specimen with short ovate leaves and wide trumpet-shaped blooms of deep blue; three new species from among the related series have to be recorded namely: *G. ecaudata* (F. 22797 type), *G. heptaphylla* (F. 405 type) and *G. subocculta* (F. 25954 type).

While *G. ecaudata* is similar in general appearance to the well-known *G. hexaphylla* the other 2 species are also magnificent plants. *Gentiana heptaphylla* was an early discovery; Forrest found it in September 1904 on the western side of the summit of the Kari Pass and also on the descent to Chu-pa-lung Valley on the Yangtze-Mekong Divide at 15–16,000 ft. This cushion-form plant has many short stems; some are only leafy shoots but others, which are up to 5 in. in length, terminate in a wide open trumpet flower of pale blue and nearly 2 in. in length.

Gentiana subocculta which was found at the same time (September 1904) is an even more outstanding plant. There were several collections of this species made later, on the Chungtien Plateau at 11–12,000 ft., on the Mekong-Salween Divide, Mekong-Yangtze Divide and the Salween-Kiu-chiang Divide, and in 1924 north of Pien-tien-go in the Mekong-Yangtze Divide. A plant of from 6–10 in. in height, it has large wide trumpets of clear sky-blue and whorls of half to three-quarter inch leaves, several whorls of which are clustered just below the flowers. It is indeed a wonderful plant and how disappointed Forrest must have been when the seeds of this species did not germinate, or if they did, that the plants did not survive in this country.

An attractive species, very different in type to the foregoing and one which has remained in gardens since its introduction in 1917, is *G. stragulata* (F. 14636 type). Forrest found it in N. W. Yunnan, on the Mekong-Salween Divide and at Tsarong in S. E. Tibet, growing in moist stony pastures. Forming a dense mat of small rosettes, it has long tubular flowers of bright purplish-blue, usually one to a stem but up to three may be borne on the ends of short stems of 2–3 in.

In 1906, when Forrest was collecting in the open meadows on the eastern flank of the Li-chiang Range, he found a beautiful Gentian that was to honour his name a few years later: *G. Georgei*. It is closely allied to the older *G. Szechenyi* and, in the opinion of some authorities, is only a larger flowered and finer coloured form of that species. It forms a central rosette of lanceolate leaves of over 2 in. in length; these leaves are overlapping and as they are in pairs, they form a distinct cross. From the base of this rosette several flowering stems radiate, each bearing a giant trumpet flower about 2½ in. in length with wide open mouth nearly 2 in. in diameter. It is described in the field notes as follows: "Plant of 2–3 in. Corolla deep

GENTIANA SINO-ORNATA
in the Wild:
one of Forrest's
finest introductions

Photo, G. Forrest

purplish-blue interior, exterior striped greenish with the base green." Several collections of this remarkable species were made in Yunnan and S. E. Tibet but the plants that were raised did not survive in cultivation.

A species very like the Himalayan *G. tubiflora*, but differing in having a more trumpet-shaped corolla, which inhabits several places in N.W. Yunnan and S.E. Tibet was sent home and named *G. filistyla* and also many forms of the well-known *G. phyllocalyx*. Some of these forms were so magnificent as to be considered new species.

Three of Delavay's discoveries were brought into cultivation by Forrest, namely, *G. microdonta*, *G. cephalantha* and *G. rigescens*, all three being of similar habit. The first named, *G. microdonta*, is a plant of 6–18 in. in height with steel-blue flowers arranged in a loose inflorescence, some at the top of the stem and with the remainder in the axils of the leaves. It was collected in N. W. Yunnan and S. E. Tibet.

Gentiana rigescens and *G. cephalantha* are both tall leafy species, their stems up to 18 in. in height. They have many characters in common and were for a long time confused in gardens. Their stay in cultivation was of brief duration, probably due to their flowering so late and not setting seed. The latter species was found mostly in Yunnan; the other was collected on the hills around Tengyueh and on the eastern flanks of the Li-chiang and Tali Ranges.

There were many other perennial and a great number of annual species collected and it was one of the latter that commemorates his name—*G. Forrestii* (F. 14183 type), collected in the Mekong-Salween Divide. It is a small plant, 2–7 in. in height with flowers of blue interior and blue-green exterior. While most of the annual species are of little value to the garden, there are several very beautiful plants, which, if they could be established in this country, would be worthy of a place.

The genus Crawfurdia, prior to Marquand's paper in *Kew Bull.*, 1931, had been kept as an independent genus and it was as Crawfurdia that at least two of Forrest's most magnificent plants were described. With the reduction of the genus Crawfurdia, new specific names had to be found for them. One plant in particular that was described as *Crawfurdia Trailliana* (F. 963 type) was altered to *Gentiana Helenii*. This plant in its natural grandeur must have been a magnificent spectacle. Very free in growth, the individual flowers are over $2\frac{1}{2}$ in. in length and for half that length are widely funnel-shaped. It may be of interest to quote Forrest's field notes on the distribution of his first collection of this species. "Climber of 6–20 ft. Flowers rich deep heliotrope. Damp shady situations on tall grass, and scrub. Side valleys of the Salween, Salween-Irrawaddy Divide from Shih-Pai-Lei-Ti north to Nu-Ko-Ti lat. 26° 10′ to nearly 27° N. alt. 5–7,000 ft. Forms a distinct belt never above nor below those heights, N. W. Yunnan Nov. 1905."

This species shows in marked degree the climbing character, not only of the shoots but also of the flower stalks; the flowers are arranged in the axils of the leaves with a flower at the end of the shoot as well. While the type

GENTIANA
DELAVAYI

Photo, G. Forrest

GENTIANA
GEORGEI

plant is described as having flowers 7 cm. long, in some of the later collections made by Forrest, especially those in 1924 from the hills north of Tengyueh, the length of the flower is even greater.

In the same year, 1905, another species of the same section was found, in Upper Burma on the Mekong-Irrawaddy Divide at 8–11,000 ft. and also on the Irrawaddy-Salween Divide. This Forrest described as *Crawfurdia Bulleyana* but the name was altered by Marquand to *Gentiana Bulleyana*. *Gentiana Bulleyana* is of climbing habit too; the stems are 10–20 ft. in length, the flowers are bluish-purple, and about 2½ in. in length.

Several other new species of climbing habit were found, mostly in N.E. Upper Burma, such as *G. bomareoides*, *G. crawfurdioides* and *G. membranacea*.

GORDONIA AXILLARIS

From a coloured drawing by W. Fitch in
"Curtis's Botanical Magazine", t. 4019

GORDONIA

Gordonia chrysandra is a handsome evergreen of the Ternstroemiaceae or Tea family. So far little use has been made of its decorative qualities. Yet the dark leathery foliage provides a pleasant background for the fragrant, creamy white, Camellia-like flowers with their vivid orange anthers. The bark is smooth and ash grey in colour. In its natural habitat the plant may grow to a height of 35 ft.

In the field notes of his Yunnan expeditions, George Forrest mentions that he found the plant growing in moist open situations among thickets or along their margins, among scrub or on rocky slopes. He collected it from a region roughly a hundred square miles in area, at altitudes of 5–9,000 ft. The climate there is subtropical with a high rainfall; the soil is volcanic and very fertile, supporting a rich, varied vegetation.

Forrest first collected specimens in 1912 on the lava beds that lie to the west of Tengyueh at 25° N., 89° 30′ E. In 1917 he found it further north in the Hsia-kuan Valley and on the western flank of the Tali Range. On later expeditions, including the final tragic one, specimens were added from the hills south of Tengyueh, the hills around Lung-fan, and the Shweli-Salween Divide.

These localities are all in W. Yunnan, but different collectors have found *Gordonia chrysandra* in other regions. Henry obtained it in E. Yunnan at Mengtze; Tsiang, N. K. Chun and W. Y. Chun gathered it in Kwangtung Province near Hongkong (22° 12′ N., 114° 30′ E.); one specimen also came from S. Szechwan at Kikiang-hsien (28° 54′ N., 106° 42′ E.).

Gordonia chrysandra was first described by Cowan (Notes R.B.G., Edin., LXXIX 1931) from material supplied by Forrest (F. 9234 type). At the same time, he noted what appeared to be a distinctive form with white bark, (E. E. Maire 592; Mai 1914 Vallée de Long-Ky, 900 m. Arbre moyen, tronc blanc, lisse; feuilles persistantes d'un vert luisant, fleurs blanches.)

As its subtropical habitat would lead us to expect, *Gordonia chrysandra*, in this country, needs the protection of a cool greenhouse; given this it is reasonably hardy and flowers well. There are several reports in the Journal of The Royal Horticultural Society of the plant in the Temperate House at Wisley flowering in January and February. The sweet scented, gold and white flowers are a welcome and lovely sight in that bleak time of the year.

The magnificent specimens of *Gordonia axillaris* collected by Forrest on

the Nmai Hka-Salween and Shweli-Salween Divides are among the finest in his vast herbarium. Yet, in his notes, prosaic as was his wont, he comments merely: "Shrub or tree 25–60 ft., flowers fragrant, fleshy, pure white, anthers golden yellow. In groves and open forests." This genus of some 30 species mainly from India or other parts of Asia, but from America also, has been represented in cultivation for nearly two centuries, and the fine figure of *G. axillaris* reproduced here is from the *Botanical Magazine* (t. 4019), the original plate having been prepared from a plant which flowered at Kew as long ago as the year 1842. Forrest's specimens were collected at elevations of 6–9,000 ft. and plants from these comparatively low altitudes do not usually long survive in the open in this country even in the most favoured gardens. The same limitation applies unfortunately to *G. chrysandra*.

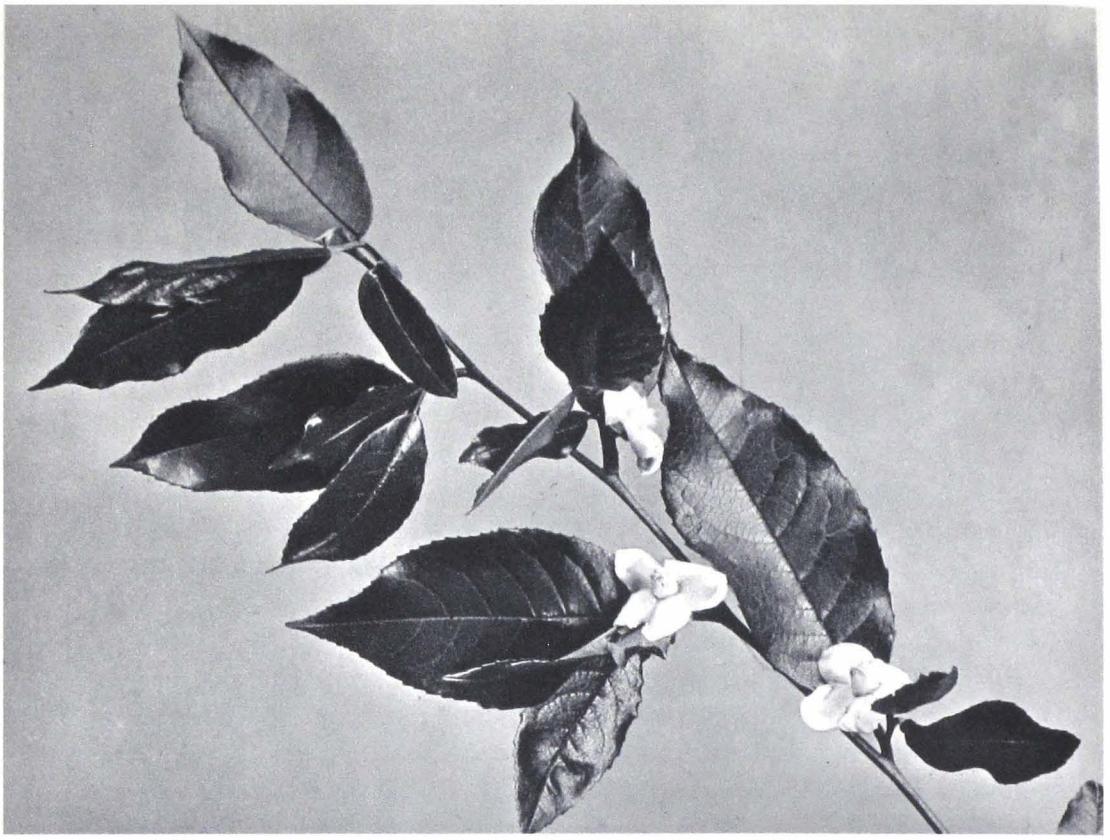
HARTIA

This genus, belonging to the family of Ternstroemiaceae and thus related to Stewartia and Schima, was based on material collected prior to 1890 by Henry in Yunnan, both south of Manmer in the Red River Valley at 6,000 ft. and in the Ssu-mao forests at 7,000 ft. There is no record of *Hartia sinensis* in cultivation until it was raised from seed sent home by Forrest. Several collections were made by him, the first in 1912 at 5,000 ft., west of Tengyueh was described as "Shrub or tree of 25–50 ft. Flowers creamy yellow, anthers golden; open situations in thickets." During the following year he found it at a higher altitude in the Shweli Valley, and in 1924 even higher (8–9,000 ft.) on the Shweli-Salween Divide. This collection (F. 24406) is at Edinburgh and the flowers are creamy-white rather than creamy-yellow. Henry described his discovery as "white".

The flowers, which resemble those of Stewartia, are borne singly in the axils of the leaves, usually on short lateral shoots. The flowers are over an inch in diameter with five broad crenate corolla lobes. Within, the numerous stamens are bunched together to form a golden mass. Although at first glance the foliage resembles that of the ordinary tea plant, it is of a slightly different shade of green. The dull red leaf stalks are boat-shaped and protect the growing points of the shoots for a time. The more or less ovate pointed leaves with toothed margins are up to four inches in length.

More recently two other species have been discovered including *Hartia serratisepala* and *H. yunnanensis*, both endemic to Yunnan bringing the total for that area to three. All require a moist peaty soil similar to that required by Camellias.

There is no doubt that *Hartia sinensis* can be a beautiful tree but, unfortunately it is only for the milder districts; even in Cornwall it has been badly damaged by frost in certain winters. In Edinburgh, although several plants have been tried in sheltered places out of doors, only the one which is growing under glass has survived.



Photo, R. Eudall

HARTIA SINENSIS

Photo, R. M. Adam

HEMEROCALLIS FORRESTII

Although Forrest's Hemerocallis collections are not numerous, they are of very great interest. In addition to *H. fulva*, which name covers several cultivated clones and various wild types or varieties, which he found being cultivated by the natives of the Li-chiang and Tali Ranges, Forrest discovered a small group of dwarf or semi-dwarf types of species growing more or less intermingled in the mountains of N.W. Yunnan and Sikang. Three of these types, all of which are in cultivation, have been given specific rank, *H. Forrestii*, *H. nana* and *H. plicata*. The first was found on the eastern flank of the Li-chiang Range in 1906 at an elevation of 9–10,000 ft. In subsequent years it was gathered in the same locality as well as on the Chien-ch'uan-Mekong Divide and on the Muli Mountains of Sikang, sometimes at the higher altitude of 12,000 ft. Forrest's Day Lily has foliage about 18 in. long and half an inch in width. The slender branched or unbranched scapes as a rule are shorter than the leaves and bear on short pedicels 8–10 orange or reddish-orange non-fragrant flowers.

Strongly reminiscent of *H. Forrestii* are several gatherings which Forrest made on the Tali Range and on the mountains east of Yungning in Sikang and which Diels named *H. fulva* var. *angustifolia*. Their affinity with *H. fulva*, however, is very remote, for they lack the peculiar feathery nervation of the perigone segments so characteristic of this plant. On the other hand they are very nearly allied to *H. Forrestii*. Stapf, however, (*Bot. Mag.* sub. t. 8968) believed them to be sufficiently distinct from *H. Forrestii*—leaves more folded, bracts smaller, perigone-tube longer and perigone segments a different colour when dry—to merit specific rank, and named them *H. plicata*. But when one is confronted with a series of gatherings of *H. Forrestii* and *H. plicata* such as is represented in the Edinburgh Herbarium, one realises that the characters used for separating the two are not so well defined and constant as might be supposed from Stapf's key. It seems to this writer at any rate, that *H. Forrestii* and *H. plicata* may well represent nothing more than variations in a single wild species.

The third member of the group, *H. nana* (F. 10539 type), which in nature grows at a rather higher altitude than the rest, is, as its name suggests ideally dwarf and suited to the rock garden. The leaves are linear and the large flowers, solitary or in pairs, have their narrow orange coloured segments flushed with red on the back and elegantly recurved. Though the plant is readily separated from the rest in the Herbarium, and though Forrest regarded it as a distinct entity, one wonders whether even this may not be merely a high elevation and dwarf form of *H. Forrestii*.

In cultivation the verdict must be that, on the whole, they grow somewhat poorly. But all three have been used in hybridisation work, particularly in America, with *H. flava*, *H. minor* and *H. Dumortierii*.

Photo, Miss Blanche Henry

HYPERICUM PATULUM VAR. FORRESTII

HYPERICUM

The Hypericums, flowering late as they do from midsummer until late autumn, supply the garden with blooms of various shades of yellow at a time when there is a shortage of flowers of this colour. The genus is almost entirely confined to the Northern Hemisphere stretching from North America through Europe to North Asia, each continent supplying several attractive species suitable for British gardens. Those native to Northern Asia, and particularly those sent home in the Forrest collection, compare favourably with those from elsewhere.

Hypericum patulum is one of the most showy species. First described almost 170 years ago, Forrest found it growing in dry stony pastures, 5–10,000 ft. above sea level, in the province of Yunnan. It is a small shrub, which grows to a height of from 2–4 ft. and produces at the ends of the shoots of the current year's growth, rich yellow cup-shaped flowers up to 1½ in. across. The species is reputed to be slightly frost tender, but two of its very fine varieties, *H. patulum* var. *Henryi* and *H. patulum* var. *Forrestii* do not suffer from this weakness. Until the introduction of the latter plant *H. patulum* var. *Henryi* was considered one of the finest plants in the genus; since then, however, it has given way to Forrest's introduction.

Found growing on the slopes of the Li-chiang Range, *H. patulum* var. *Forrestii* flowers continuously from June until September, producing golden yellow cup-shaped blooms 1–2 in. in diameter, and must be the most desirable and one of the largest flowered Hypericums in cultivation. It is perfectly hardy and will attain a height of 3–4 ft. Its fine qualities gained it an Award of Merit from The Royal Horticultural Society in July 1922.

Forrest's collections also include *H. Ascyron*, a sub-shrub with square stems and *H. japonicum*, a very fine foliaged species which flourishes on the eastern flank of the Tali Range. In this same area *H. Hookerianum* and its large orange-yellow flowered variety *Leschenaultii* are found.

Growing in W. Yunnan in rocky situations, *H. elodeoides*, with flowers a pale lemon shade, reaches 12–18 in. in height, while near the head of the Mekong Valley, *H. Lalandii* produces at the ends of weak growing shoots, bright orange flowers. *Hypericum monanthemum* var. *nigro-punctatum* has flowers of bright yellow and seems to enjoy the shade afforded by mixed forests for its growth.

Photo, G. Forrest

INCARVILLEA LUTEA IN YUNNAN

INCARVILLEA

The Incarvilleas which Forrest collected in China fall fairly naturally into two groups, those with cauline leaves and those for the most part with radical leaves only. In the latter group are *I. compacta* with the shortly peduncled flowers arising from a tight rosette of leaves; *I. grandiflora* with its large solitary Gloxinia-like flower on a tall scape; the finer and dwarfer *I. grandiflora* var. *brevipes* with two or occasionally three flowers to the scape, described from Forrest's material and introduced to culture by Messrs. Bees Ltd. from Forrest's seed; *I. Delavayi* introduced by Messrs. Vilmorin & Co. in 1893, and still the most amenable and free flowering species in cultivation. Of the other group, the simple-leaved *I. Forrestii* and the long-racemed *I. altissima* are two of Forrest's discoveries which have never been seen in British gardens. For the rest *I. arguta*, better known as *Amphicome arguta*, was flowering in the garden of the London Horticultural Society as long ago as 1837; *I. variabilis* with its compound pinnate leaves and usually rose-carmine flowers was induced to bloom, probably for the first time, in Kew in 1898; whilst *I. lutea* was introduced by Messrs. Bees Ltd. in 1911 from seeds collected by Forrest.

Of this latter plant, Forrest, never given to overstatement, wrote thus: "Of the countless and beautiful alpines which inhabit the mountains of N. W. Yunnan, few stand out more prominently than *I. lutea*." It was one of the many fine species in the first collections of the Abbé Delavay, and was discovered by him in 1889 on the mountains surrounding the source of the Lankiung River. Forrest made but two gatherings; the first in 1906, the second in 1910, both from the scrub-covered ledges of the limestone cliffs at the southern end of the Li-chiang Range. Rock also collected it here, as well as on the Muli Mountains of Sikang. From these collections it is clear that our plant is a most striking one, its racemes of large pure pale yellow or apricot tinted flowers standing above the graceful dark green glossy pinnate leaves. Forrest described it as a biennial, in the sense that immediately it has flowered and seeded, it dies, although a plant often takes from 3–5 years to reach the flowering stage. In culture it is not in the least difficult to grow. Seeds germinate freely and fine large plants with thick carroty tubers develop but flowers are produced very rarely indeed. In fact only one record of flowering is known to the writer, and that in the garden of the late Sir John Maxwell in 1935.

INDIGOFERA

First collected by Delavay in 1887, it remained for Forrest to introduce *Indigofera pendula*, a beautiful ornamental shrub with long pendulous racemes, the flowers of which are dove-grey on the exterior, deep rich rose in the interior. He gathered it during his first expedition on the eastern flank of the Li-chiang Range where it grew in open situations to a height of from 4–12 ft. Seeds from a later gathering were presented by Mr. J. C. Williams to Kew in 1914, and the resultant plants provided the material from which the plant was figured in the *Botanical Magazine* of 1918 (t. 8745).

In its natural habitat *I. pendula* is found in association with stunted mixed scrub of Philadelphus, Deutzia, Berberis, *Lonicera Maackii* and *Ligustrum Delavayanum*. Cultivation in Britain in a well drained soil and in a sunny position offers no difficulties. Plants at Kew and Wisley have been known to be killed back during cold weather, but they have recovered and flowered well again. A plant at Kew, for instance, made 7 ft. of growth in a little over a year. This species is valued for the length of its flowering season which extends from July till October and gained an Award of Merit when exhibited by Mr. Reginald Cory in 1925 at The Royal Horticultural Society.

The first of Forrest's discoveries, *I. rigioclada* (F. 2099 type), a procumbent shrub of 1–2 ft. with rich rose-red flowers, was found on the Li-chiang Range in May 1906. Subsequently he gathered what appears to be the same plant on the Tali Range and on the Chungtien Plateau, although in these localities, it is not procumbent, but an upright shrub of from 3–10 ft. In the same year Forrest gathered *I. Dielsiana* (F. 4251 type), a plant with pale rose or greyish-rose flowers from the Tali Range, and a single specimen of *I. argutidens* (F. 2651 type) a dwarf shrub of 1–2 ft. Rock later found this species in the Yangtze watershed. From the Li-chiang Range, in May 1910, again the only collection, Forrest got *I. Balfouriana* (F. 5627 type), the geographical range of which Handel-Mazzetti and Schneider extended into Szechwan. *I. Forrestii* (F. 7000 type), a dwarf shrub of 1½–2 ft. with deep purplish-rose flowers, he found two months later on the Tali Range, and in July and August 1913, he gathered 2 new species from the Yangtze Bend. One of them, *I. calcicola* (F. 10350 type), has dull rose flowers and minute silvery leaves. The other, *I. dumetorum* (F. 10734 type) is a far more striking plant with pale yellow flowers and handsome foliage thickly matted with hairs especially on the lower surface.

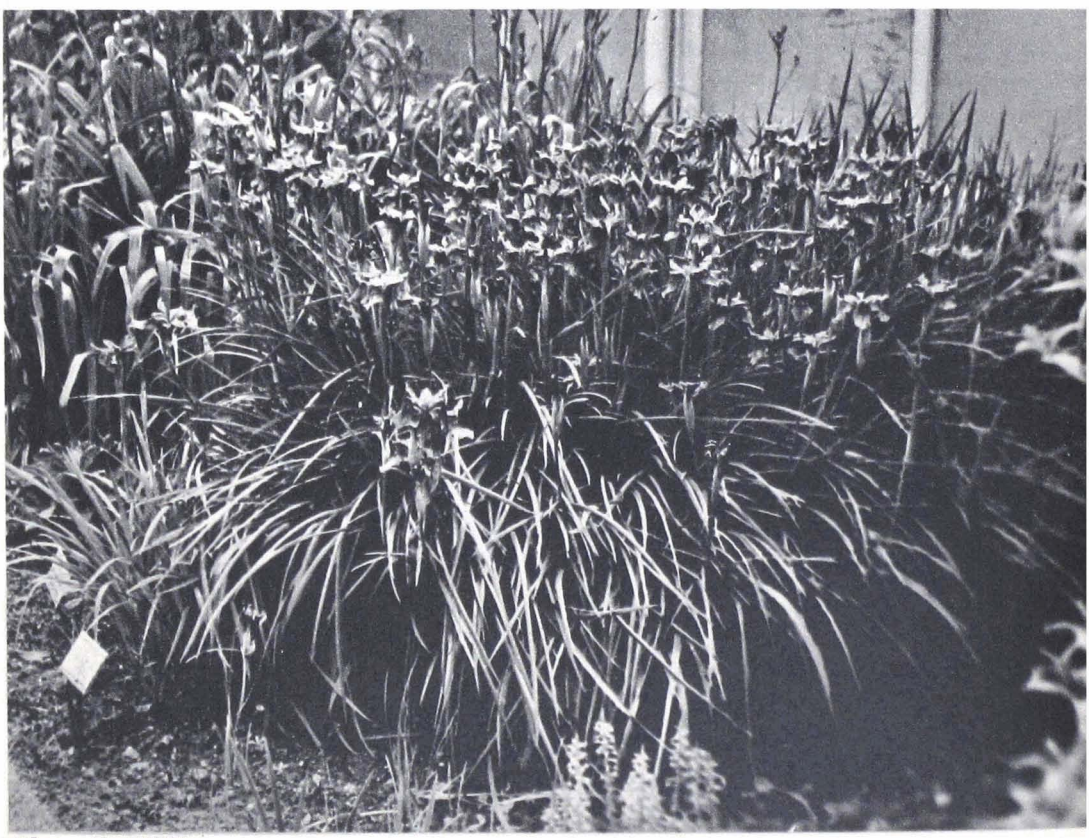
IRIS

From Yunnan and Szechwan 18 species of Iris have been recorded, and Forrest failed to find only 4 of them—*I. Henryi*, *I. songarica*, *I. ensata* and *I. Milesii*. Of the 14 species he collected, all but 2—*I. goniocarpa* and *I. Potanini*—have been in cultivation and many of them still are, due in large measure to Forrest's importations of seeds. It is an impressive record, though from the point of view of new species, not a spectacular one. Certainly he was the discoverer of the lovely plant which bears his name. It is probable too, though apparently he had no recollection of having seen it in the wild, that he was the first to find that Iris of uncertain origin, *I. Bulleyana*; at any rate herbaria contain various Forrestian gatherings from S. E. Tibet and from Yunnan which are identical with the plant Dykes first received from Mr. A. K. Bulley and named in his honour in 1910. Otherwise, Forrest either refound or reintroduced plants long known to science, or, as in the case of *I. chrysographes* and *I. Wilsoni*, species which Wilson had discovered but a year or two previously.

For instance, *I. goniocarpa*, which ranges from Sikkim to W. and C. China, had been known to occur near Tatsienlu in Sikang since Pratt had collected it there in 1890 but Forrest did not find it until 1922 and then in Sikang at Muli. Again, on six of his seven expeditions Forrest showed that those species with Hemerocallis-like roots, *I. nepalensis* and *I. Collettii*—if indeed they really be distinct species—were by no means uncommon on the mountain ranges of Yunnan. The former had been known from Nepal since Wallich had gathered it there in the early 1820's, and Augustine Henry had established its presence at Mengtze in S. Yunnan round about 1896. And though Sir Henry Collett had found the Iris which commemorates his name in the Southern Shan States of Upper Burma in 1888, Delavay had collected it the year previously from an unknown locality in Yunnan. It is much the same with *I. kumaonensis* which opens its flowers when the leaves are quite short and forms its capsules near the base of the mature foliage. Wallich again, apparently in Kumaon, was the first to collect it and by the end of the century it was recognised as a common high elevation plant in the Garhwal and Kumaon districts of the Himalaya, where every serious collector had gathered it. In 1917 Forrest discovered it in the Mekong-Salween Divide and in the following year in the Muli Mountains of Sikang. Credit for the discovery of this important extension in range goes not to Forrest, however, but to Kingdon Ward, who took specimens of the plant from Atuntze in 1911. On the other hand Forrest's

Photo, R. M. Adam

IRIS FORRESTII



Photo, D. Wilkie

IRIS CHRYSOGRAPHES

Both in the Royal Botanic Garden, Edinburgh

discovery of the highly elevated N.W. Chinese *I. Potanini* on the Li-chiang Range in 1906 constitutes a new record for Yunnan and an extension of the area of distribution from Sikang, where Prince Henri d'Orleans had gathered it in 1890.

Likewise, Forrestian gatherings of *I. ruthenica*, which hails from the dry central and southern regions of Transylvania and Central Asia up to the Okhotsk Sea, are new records for S. E. Tibet and Yunnan, and a further extension in this plant's distributional range from Sikang where Mussot had discovered it at Tatsienlu in 1898. But when Forrest found in 1906 *I. japonica*, a woodland species of C. China and Japan, and *I. tectorum*, which decorates the thatches of so many Japanese houses and has probably been cultivated in China and Japan for centuries, he was merely confirming the finds of Delavay and of Henry in Yunnan before the turn of the century.

Henry too, had established the presence in Yunnan of *I. laevigata*, prior to Forrest's meeting with it in the Tali Valley in 1906. In fact this beautiful marsh Iris of Eastern Asia, China and Japan, was even in European culture before this date, though under the name of *I. albopurpurea*. Likewise *I. Delavayi* had been introduced into Le Jardin des Plantes in 1889 through seeds sent by Delavay from Yunnan and had flowered in this country in 1898, before Forrest located it on the Tali Range in 1906.

In this year the Tali Range yielded no less than 5 species to him; *I. Collettii*, *I. Delavayi*, *I. japonica*, *I. laevigata* and *I. ruthenica*. But rather remarkably *I. chrysographes*, a far finer species than these and at that time unknown to science, although inhabiting this same range, evaded him until 1910. In the meantime this magnificent plant with its rich deep reddish-violet, or sometimes almost black, falls, very velvety in texture and exquisitely "inlaid with gold", was discovered by Wilson to the west of Kuan Hsien in W. Szechwan in 1908. Abundant gatherings which Forrest made in 1910 and on every subsequent expedition have shown this species to be widespread both in Yunnan and Sikang.

Even more remarkable is it, that also in 1906, and quite independently of each other—Forrest on the Li-chiang Range and Wilson in W. Hupeh—both should have discovered yellow flowered species closely akin to *I. chrysographes*, *I. Forrestii* and *I. Wilsoni*. Later Forrest recorded Wilson's plant also from the Li-chiang Range and both species from several localities in Yunnan and Sikang. As garden plants they are invaluable, with *I. Forrestii*—shorter and more slender in habit, and with clearer yellow flowers with erect standards—the more pleasing species. It has proved very useful for hybridising with *I. chrysographes*; but good as many of these hybrids are, they lack the true elegance and beauty of the parents, both of which have received the Award of Merit, *I. Forrestii* in 1924, *I. chrysographes* in 1914.

JASMINUM
POLYANTHUM

Photo. G. Forrest

JASMINUM

Like so many other genera in the family Oleaceae, Jasminum is enhanced by a truly delightful scent, which is very much in keeping with its old-world connection. Throughout China many species and varieties of Jasmine are to be found growing wild and, as expected, the George Forrest collection includes many of them.

Perhaps the species most widely known and grown is the yellow *Jasminum nudiflorum*, justly favoured for its winter flowering habit. A dwarf variety of this species, *Jasminum nudiflorum* var. *pulvinatum* (F. 14478 type) was found by the collector in the mountainous regions of S. E. Tibet and N. W. Yunnan, where it forms cushion-like shrubs barely 12 in. high. The bright yellow flowers produced on the densely crowded branches add colour to the open moorlands and the dry cliffs on which this plant grows.

A very valuable Forrest introduction is *Jasminum Beesianum* (F. 2021 type), a small growing shrub of from 1–3 ft. The pink to deep rose flowers are very fragrant and are borne in small clusters during July and August. It was discovered at the south end of the Sung-kwei Valley growing amongst rocks and stones on the barren open ground. This species bears the name of the seed firm for which Forrest was then collecting material. Since its introduction it has been hybridised with *Jasminum officinale* var. *grandiflorum* to produce Jasminum x "Stephanense" a vigorous climber which bears its pale pink flowers in terminal clusters during July and August.

In 1931 while collecting in the region of Tengyueh, Forrest and Major Lawrence Johnston, who was accompanying him at the time, gathered specimens of *Jasminum polyanthum* and from this collection the species was introduced into cultivation. This attractive climbing shrub with flesh pink strongly scented flowers must be one of the finest Jasmines in our gardens today. It is only hardy in warmer areas of the country but is one of our very best cool greenhouse plants, being very rapid in growth and very floriferous. It received an Award of Merit from The Royal Horticultural Society in March 1941 and in 1949 a First Class Certificate and the Sander Medal when shown by Lord Aberconway. It has been selected on more than one occasion by Lord Aberconway to grace his desk at the Annual General Meeting.

Two varieties of *Jasminum heterophyllum* were discovered by Forrest, *Jasminum heterophyllum* var. *glabricorymbosum* (F. 9990 type) and *Jasminum*

heterophyllum var. *subhumile* (F. 5529 type). The former is a shrub 6–8 ft. high which inhabits the ledges of the limestone cliffs on the Lankiung-Hoking Divide. It has very fragrant golden yellow flowers. The latter variety is similar in stature but has flowers more orange in colour and prefers the open moist situation in the Sha-yang Valley. The lilac fruits of this variety are an added attraction during the autumn.

Jasminum dumicolum (F. 12164 type) was found on the Shweli-Salween Divide in Yunnan at an altitude of 8,000 ft. There it scrambles through shrubs and small trees sometimes attaining 20 ft. in height. In such situations it displays its deep rose pink flowers to advantage.

Finally to honour the collector a new species from Yunnan was named *Jasminum Forrestianum* (F. 7861 type). It is a scandent shrub of 8–20 ft. with sweetly scented flowers which are flushed pale rose, but has not unfortunately yet been introduced into cultivation.

LILIUM

During his many journeys in China and Upper Burma, Forrest collected well over a hundred specimens of Lilium representing approximately a dozen species and varieties. While most of the species had been found previously by other collectors, the copious material sent home by Forrest provided valuable help in unravelling the confused nomenclature and taxonomy of the genus in China. Unfortunately *Lilium Forrestii* named in his honour, has proved identical with the earlier described *L. lankongense*.

A new species, *Lilium Stewartianum*, was found on the limestone cliffs of the Li-chiang Range in 1923 at altitudes of 11–12,000 ft. This lovely lily, akin to *L. primulinum*, was named for Lawrence Baxter Stewart, who was for many years employed by the Royal Botanic Garden, Edinburgh, first as Plant Propagator and later as Curator. Known only from herbarium material, *L. Stewartianum* is not a robust plant and is uncommon on its native mountains. It bears its solitary drooping fragrant flowers on stems 1½–2 ft. tall, which are furnished with grassy leaves. Forrest in his field notes described it as having the "ground colour deep olive-yellow but almost black with deep crimson markings" or again "greenish-yellow, profusely spotted maroon".

Many collections of *Lilium Bakerianum* were made by Forrest and his material, both herbarium and horticultural, served to demonstrate the great variability of this species. Taken in a broad sense it divides into five varieties occupying different geographical areas and differing principally in flower colour. All are rather tender and have bell-shaped flowers, the colour ranging from pale greenish-yellow to olive-brown spotted with reddish-purple or crimson. The type of *L. Bakerianum* has whitish heavily blotched flowers. Forrest introduced into cultivation *L. Bakerianum* var. *Delavayi*. This was first discovered by Delavay in 1888. It differs from the type in the greenish-yellow ground colour and the heavier spotting and blotching of the perianth with reddish-purple. Another variety collected by Forrest is *yunnanense*. Again this plant had been previously collected by Delavay, but Forrest's material showed greater variation as is illustrated from the following extracts from his field notes: flowers "pure white, minutely speckled maroon on basal half of interior, fragrant" or "white, faintly tinged rose on exterior" or "white fragrant". This plant has not proved adaptable but recently it has been reintroduced by Dr. J. F. Rock. Most attractive of all is *L. Bakerianum* var. *aureum* which Forrest found in N. W. Yunnan about 30 miles

Photo, A. Harley

LILIUM HENRICI

Photo, R. M. Adam

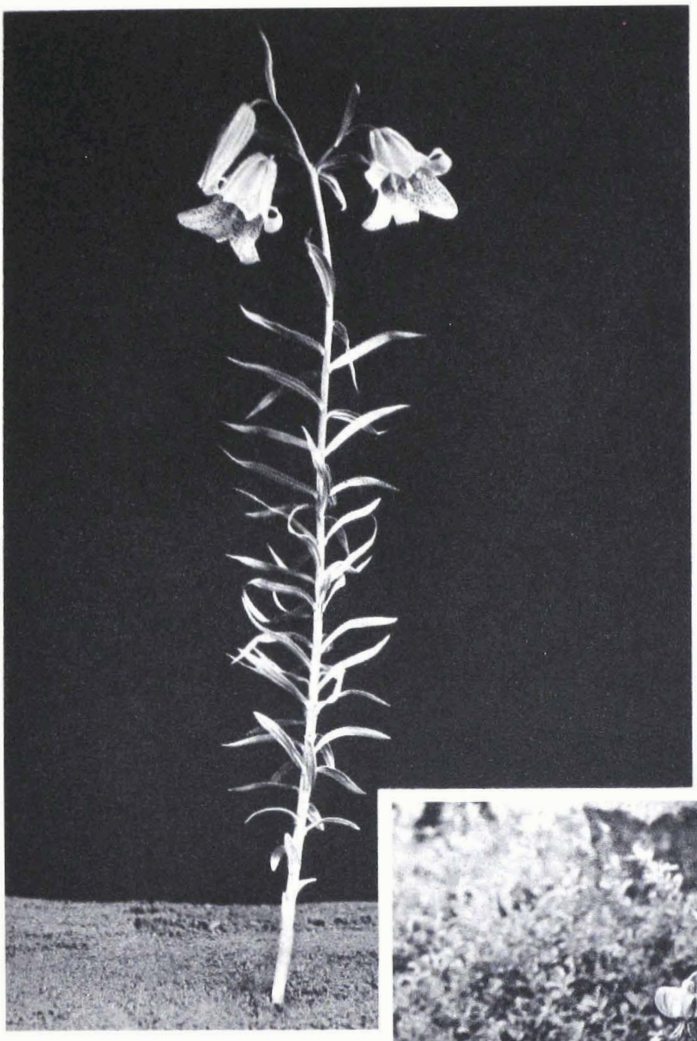
LILIUM LANKONGENSE

north of Lake Tali. Certainly his description, "a rich golden yellow throughout, minutely speckled purple on the interior from the base to the tips of the segment", makes us lament that so rare a gem has been lost to cultivation.

Two plants which stirred up much controversy, *Lilium primulinum* var. *ochraceum*, formerly *L. ochraceum*, and *L. primulinum* var. *burmanicum* were collected many times and on nearly every expedition, the former on the Li-chiang and Tali Ranges, the latter in N. E. Upper Burma and on the Mekong-Salween and Shweli-Salween Divides. Forrest again collected many varying forms and this material has been invaluable in unravelling this very complicated problem. Now it appears that they are geographical variations of colour and size. In this country *L. primulinum* var. *ochraceum* and *L. primulinum* var. *burmanicum* are satisfactory only in cool greenhouses or in very sheltered positions in favoured localities. Writing of *L. ochraceum*, Wilson in *The Lilies of Eastern Asia* states that "where *L. ochraceum* grows around the Mengtze in Yunnan, heavy summer rains prevail and though the temperature is not excessive, frost is almost unknown".

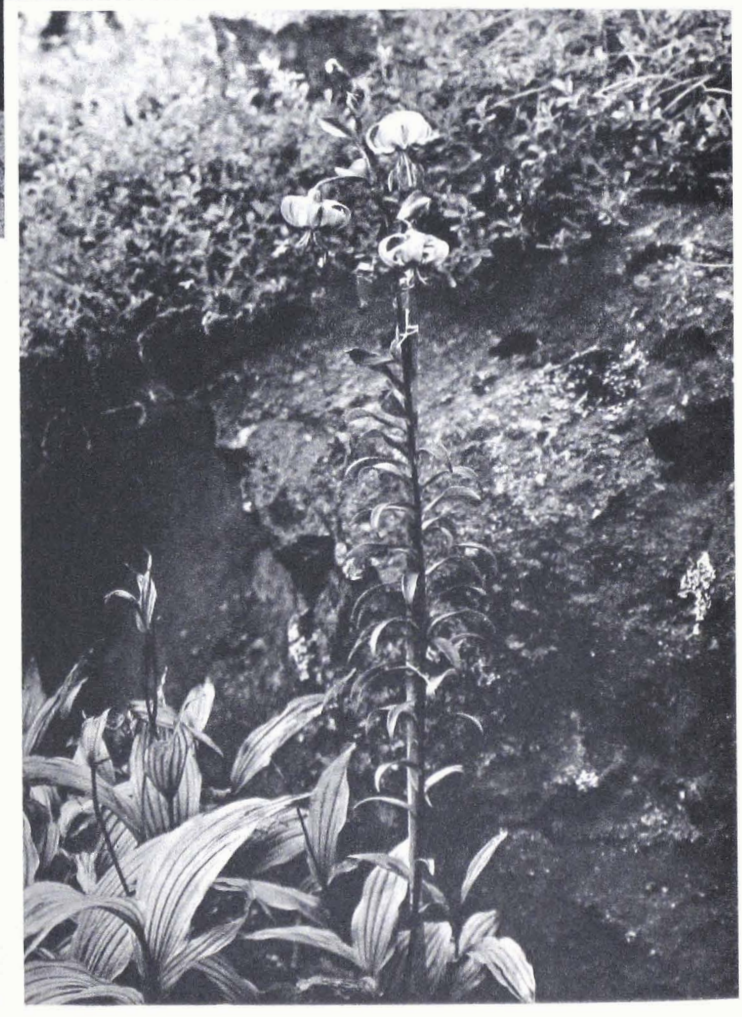
An unusual plant and one which is rare in the wild is *L. papilliferum* allied to *L. langkongense* and *L. Davidii*. Despite his many expeditions Forrest only collected it four times and very few other collectors have ever found it at all. Delavay first discovered it near Tapin-tze in N. W. Yunnan about 1888 and there is no other record of its having been found until Forrest collected it in 1914. Never having been flowered in England from his collection, it was first flowered in 1949 from bulbs sent home by Dr. J. F. Rock. According to Forrest's field notes he found it growing in dry situations on the ledges of cliffs and in open stony pastures at about 10,000 ft. in the Mekong-Yangtze and the Mekong-Salween Divides. It is described as a plant from 9 in. to 3 ft. in height with one to several fragrant turkscap flowers, deep crimson-maroon in colour, the exteriors of which were shaded with green.

Other members of the Martagon group include *L. taliense* and *L. lankongense*, two plants somewhat similar in colouring, and *L. Davidii*. *Lilium taliense* was collected several times by Forrest, first on the Li-chiang Range, then on the eastern flank of the Tali Range and subsequently on his other expeditions. It was first flowered in England in 1935 from Forrest's seed. It must, indeed, be a magnificent plant in the wild, but it is difficult in cultivation and seldom seen at its best. In the field notes it is described in one area as being from 8–10 ft. in height and carrying as many as ten flowers to a stem. The flowers are white spotted crimson or purple. *L. lankongense* is a widely distributed lily, which Forrest collected more than a dozen times. The flower stems are 2–3 ft. in height and bear in late July and August nodding fragrant flowers, which vary from white to white flushed rose, spotted with deep crimson markings. This beautiful lily does well in Scotland and Ireland. It is unfortunate that it does not bear Forrest's name as Sir William Wright Smith intended.



LILIUM BAKERIANUM
VAR. DELAVAYI

Photo, R. M. Adam



LILIUM PRIMULINUM
VAR. OCHRACEUM

Photo, R. M. Adam

Distinct from these is *L. Davidii*, with orange-red flowers heavily spotted with purple. Forrest notes that it is found on dry open situations among rocks and that it is wild on the hills but is cultivated by the natives at T'eng-yueh for the bulbs, which are sold for food under the name of "Pei-Ho". *L. Davidii* was collected many times and at altitudes from 5–11,000 ft. in the Tali Valley, Li-chiang Range and Mekong-Salween Divide.

The common Lily of China, *L. Brownii* var. *colchesteri* was collected on the Tali Range, on the Shweli-Salween Divide and in Upper Burma. (Woodcock and Stearn in *The Lilies of the World* state that this epithet is invalid as no description was published and have adopted the varietal name *viridulum* for those forms from central China and var. *australe* for those from southern areas. Forrest's material must be re-examined to ascertain whether it is of the *viridulum* or *australe* type.) Found at various altitudes between 5–10,000 ft. the huge trumpet flowers are borne on stems up to 7 ft. in height. It is a lovely lily, probably one of the finest of all trumpets, but unfortunately the varieties are not as easy in England as the type.

Another beautiful trumpet, *Lilium sulphureum* (*L. myriophyllum*), was collected by Forrest in south-east Tibet and in the Lampong Valley of Yunnan where he found it at 7–8,000 ft. Growing up to about 5 ft. in height, the trumpet is white, slightly yellowish within and often reddish. Unfortunately, this species did not prove hardy in cultivation and it is doubtful if any descendants of Forrest's own introduction survive in this country.

L. giganteum var. *yunnanense*, the Chinese variety, which is very similar to the Himalayan plant, was sent home from Yunnan. The flowers are white with crimson markings. It is, however, a smaller plant and the stems are usually distinct in their purplish-brown colouring.

Lilium Henrici was first collected by Prince Henri d'Orleans in 1895 and named by Franchet three years later. E. H. Wilson transferred the species to the allied genus Nomocharis where it remained until 1950. From the rich material collected by Forrest, two forms have been separated, namely, var. *Henrici* (var. *typicum*) which bears at the base of the white or rose flushed perianth an evenly distributed wash of deep crimson purple and var. *maculatum* which is marked at the base of the perianth with rather large and well defined crimson purple spots. All Forrest's material of this species was collected on the Mekong-Salween and Shweli-Salween Divides where it grows on the margins of thickets and on stony pastures or the edges of forests at altitudes from 10–11,000 ft. *L. Henrici* is a graceful plant growing from 1–3 ft. in height and with three or four flowers, white or white flushed with pink, to a stem. It is still in cultivation but only in limited numbers.

Photo, R. Eudall

LONICERA BRACEANA

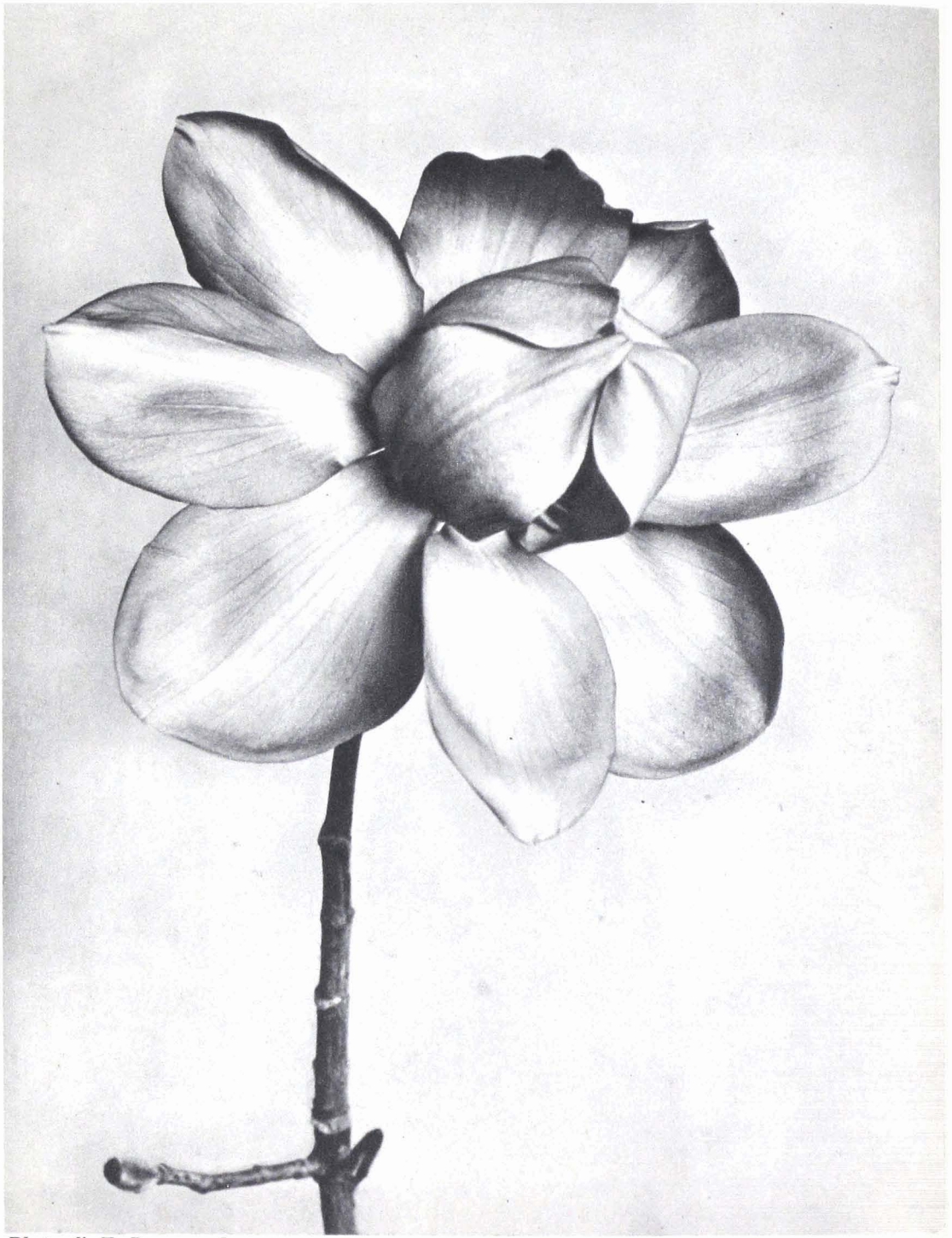
LONICERA

The Honeysuckles of W. China, Burma and Tibet bulk largely in Forrest's herbarium which contains upwards of 150 specimens, representing 38 species and varieties of Lonicera. Many of the species were already well-known, having been in cultivation for half a century or more, but others have proved to be new to science.

In 1910, while exploring the Li-chiang Range, Forrest found his first new species of Lonicera which has been named *L. chlamydata* (F. 5744 type), superseding the earlier name of *L. chlamydophora* under which this species was first described. A tall shrub with golden yellow flowers it is most nearly allied to *L. saccata* from which it differs in the larger fleshy corolla. This was followed by the discovery of *L. inodora* (F. 9273 type) growing among scrub in the Mekong Valley, Yunnan. Described as a semi-scandent shrub of no great height, with small yellow flowers, it resembles a particular variety of *L. ferruginea* found at Manipur. North of the Mekong Valley other material gathered by Forrest became the type of *L. virgultorum* (F. 9880). A shrubby species with greenish-yellow flowers and scarlet fruits, it is not far removed from *L. ligustrina*.

Specimens collected by Forrest in Yunnan and Tibet have also yielded varieties of three different species of *Lonicera*. *L. deflexicalyx* var. *xerocalyx* (F. 2386 type), found growing in pine forests on the Li-chiang Range, is distinguished by the extraordinary development of the brown, scarious sepals, which look exactly like bud scales. From the same locality came *L. angustifolia* var. *rhododactyla* (F. 10054 type) with rose-pink flowers of which the sepals, as well as the bracts, are furnished with marginal teeth. Across the Tibetan frontier in the Province of Tsarong, Forrest found a honeysuckle with creamy yellow flowers and broadly ovate leaves which proved to be a new variety of a Himalayan species and now bears the name of *L. tomentella* var. *tsarongensis* (F. 18864 type).

L. Braceana a species closely akin to *L. Hildebrandiana* and found originally on the Khasi Mountains in 1888, has since been discovered in Yunnan by Forrest, who describes it as a superb evergreen shrub with glossy foliage and a profusion of large, golden-yellow flowers which are strongly perfumed. The fruits are crimson. *L. Braceana* flourishes under glass at Edinburgh.



Photo, J. E. Downward

MAGNOLIA MOLLICOMATA 'LANARTH'

MAGNOLIA

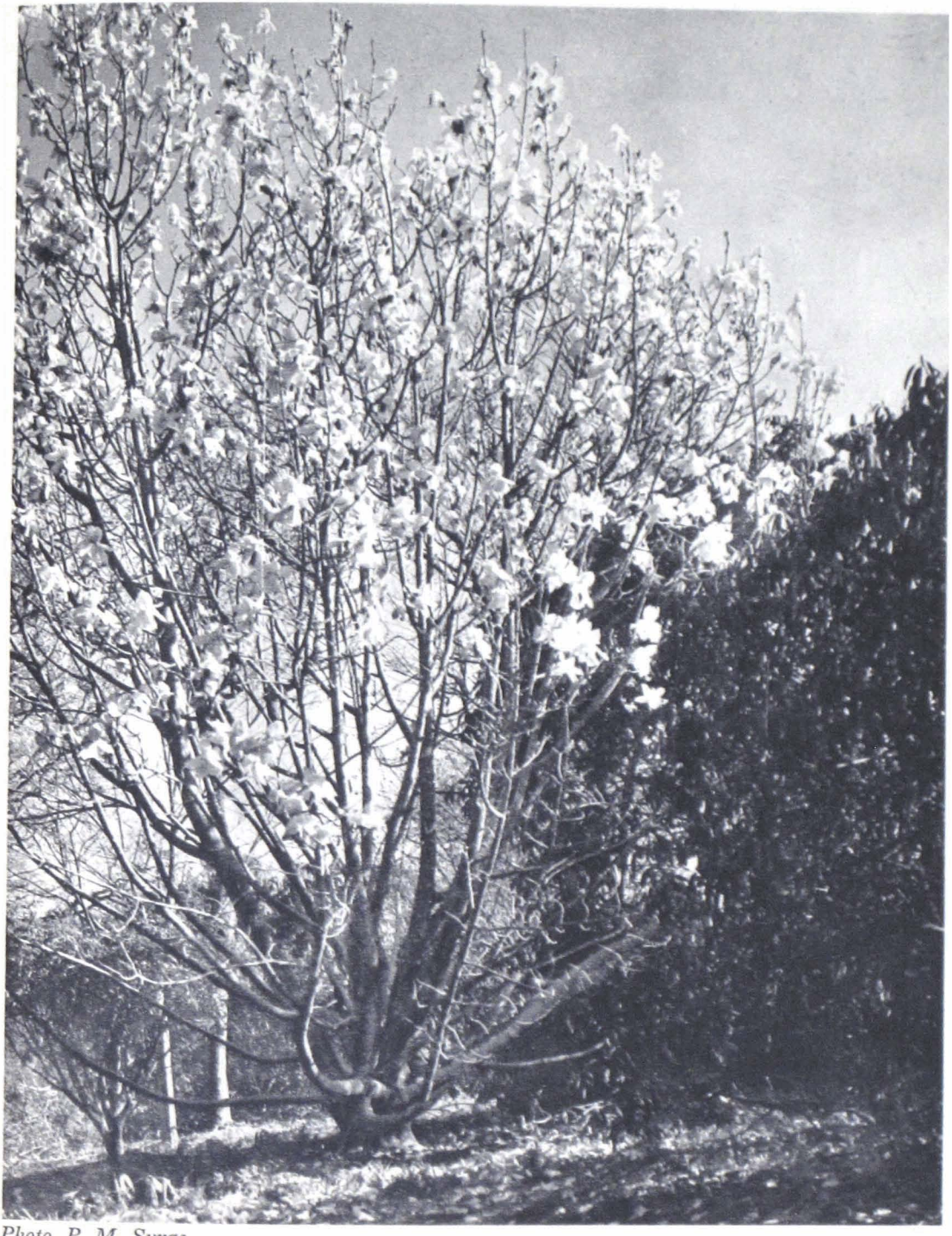
Excellent flowering and fruiting material of 8 species of Magnolia was gathered by Forrest in Yunnan, Burma and Tibet, and there have been raised from his seeds some plants of very outstanding beauty and garden merit, especially for those gardens in Cornwall, the West of Scotland and the milder parts of the country.

Prominent among these are the forms of *Magnolia mollicomata*, many of which were apparently only seen by Forrest in leaf and seed. These are very close to *Magnolia Campbellii* of the W. and C. Himalaya, but can be distinguished by the much denser indumentum on the "collar" at the base of the petiole. They also possess the very important distinction of being able to be grown to flowering size from seed in ten to twelve years, while no specimen of *M. Campbellii* has yet been recorded as flowering under twice this age. This is a very important distinction for horticulturists although one difficult to express systematically. The very dark-flowered fastigiate form raised from F. 25655 has flowers of 9 in. in diameter of a colour approaching cyclamen purple (H.C.C. 30/3) with a central cluster of even darker stamens, and received an immediate F.C.C. when first shown before the Floral Committee of the R.H.S. under the name *M. mollicomata* "Lanarth" after the famous Cornish garden where it was grown and first flowered. It has a glowing richness of colour and smoothness of petal which have not been seen yet elsewhere in the genus. Other forms of this species are much paler, even shell-pink in colour, but are equally beautiful. Forrest recorded that in W. China this species grew to a height of 80 ft. and bore flowers varying in colour from white to rose. So far no tree in cultivation in England is more than half this height but they are still comparatively young. Some specimens, however, bear hundreds, even thousands of flowers, and present a magnificent spectacle. The flowering is precocious, often in S.W. England in March, and consequently in some years the blooms may be destroyed by frosts, but the buds appear to be slightly less frost tender than are those of *M. Campbellii* from the Darjeeling District.

Another discovery of great interest was the evergreen *Magnolia nitida*, the fruit of which is stalked like that of a Michelia, a most unusual condition in the genus Magnolia. This is a native of the open forest zone in Yunnan at quite high altitudes. Forrest recorded that it occasionally reached a height of 40 ft., and plants in Cornish gardens have so far reached half that height.

Photo, J. E. Downward

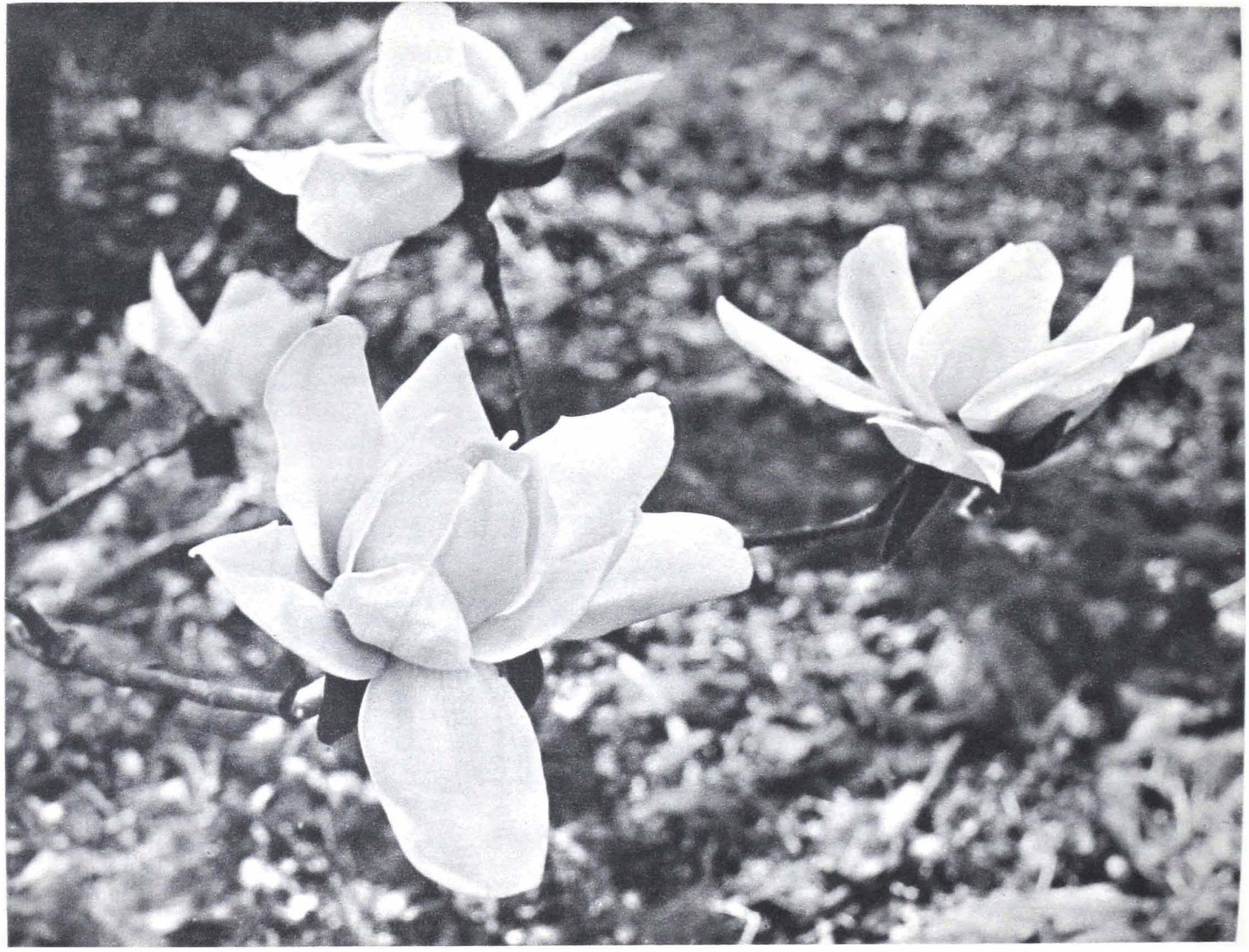
MAGNOLIA NITIDA



Photo, P. M. Synge

MAGNOLIA MOLLICOMATA

At Caerhays Castle



MAGNOLIA MOLLICOMATA at Trewithen, Cornwall

Photo. P. M. Synge

It is well named for the beautiful shiny leaves which are very distinct, and with the bronze colour of the young growth, make it one of our finest evergreens. It is, however, a tender plant outside gardens in Cornwall and the West of England. The flowers are fragrant, waxy and primrose-yellow while the outside of each petal has a deeper purplish streak down the centre.

Magnolia rostrata, another new species, was found in similar situations in Yunnan and is based on fruiting material only. It has, however, grown well in England and has flowered in several gardens. There are forms both with white and with pale rose-pink flowers. The flowers, however, are borne with the leaves and their beauty is inclined to be shielded by the leaves, which are some of the finest and largest in the genus. In a young state *M. rostrata* is easily recognised since it grows up straight and unbranched like a bean pole with the leaves all at the top. Botanically it is distinct since it has a beaked carpel.

When in Tibet Forrest also collected *Magnolia tsarongensis*, a species closely allied to and by many authorities now regarded as conspecific with *M. globosa*, an arborescent Himalayan species. *M. tsarongensis* is distinguished from *M. globosa* by the rufous red indumentum surrounding the young growth, buds and petioles. The flowers are fragrant, creamy-white in colour and rather globular in shape and in this country are not precocious. It is rather a tender species outside gardens in the milder counties of the South and West.

Forrest also collected specimens of the Yulan, *M. denudata*, one of the most beautiful of all Chinese trees and a plant now widespread in gardens, the purple-flowered *M. liliflora* and the large-leaved evergreen *M. Delavayi* which was first introduced from China in 1899 and has formed very large specimens in many gardens particularly in the West of England. The great leathery leaves are very tough and resistant to wind which makes it a useful plant for a windbreak in such gardens. On the Tali Range he also found a Magnolia which was first thought to be distinct and described under the name *M. taliensis*, but it is now considered that this was merely an immature specimen of *M. Wilsonii*, a most valuable species with large white pendulous flowers, now widely distributed in English gardens.

MANGLIETIA

Manglietia, a near ally of Magnolia and sometimes merged in that genus, comprises about 25 species widely distributed throughout tropical Asia. In one of Forrest's descriptions of the flora of W. Yunnan, he states that members of this genus are everywhere abundant on the mountain ranges between Yunnan and Burma at altitudes up to 10,000 ft. and in the course of his explorations in this region he collected material of several species, one of which proved to be new and now bears his name.

Manglietia Forrestii (F. 26705A type) a localised species, apparently endemic to Yunnan, was found by Forrest on the tree-clad slopes of hills a few days' journey from Tengyueh. In the type locality *M. Forrestii* is a much branched tree, 30–60 ft. in height, with large leaves, clothed beneath with reddish indumentum which extends to the base of the stalk. The branchlets are similarly covered with a bright red pubescence, and it is by these features in particular that this new species is separated from *M. Fordiana*, to which it is more or less akin. The flowers of *M. Forrestii* are large, pure white in colour with magenta anthers, and are fragrant like those of other Manglietias. It is quite a distinctive species although less well-known than some of its more widely spread congeners.

Other Manglietias found by Forrest in Yunnan include *M. insignis* and *M. Hookeri*. The former, a species ranging from the Far East through China to the E. Himalaya, is represented in Forrest's collection by a wealth of material gathered on the Burma-Yunnan border and in Tibet. *M. insignis* is essentially an arborescent species which grows to a great height in its native habitat, one magnificent specimen estimated to be 120 ft. tall being specially mentioned by Forrest. The flowers are 4–5 in. across, pure white in colour or suffused with purple and scented. *M. Hookeri* is closely allied to *M. insignis*, but has a more restricted distribution in Burma and the Himalaya. It was also found by Forrest in several localities in W. Yunnan, and he described it as a tall, evergreen tree with coriaceous leaves. The flowers are smaller than those of *M. insignis* and are of the same colour, but the fruits, which are almost globose, are quite distinctive, separating *M. Hookeri* from other species.

The above species have been introduced into cultivation but they are extremely tender. *M. insignis* has flowered at Trengwainton in Cornwall and though *M. Hookeri* at Lanarth has formed a large tree over 30 ft. in height, it has as yet borne no flowers.

MECONOPSIS

". . . On cliffs and screes, on stony barren slopes, as well as the more luxuriant meadows, and, . . . even among or on the margins of scrub . . . All are social plants, some are most rare and local, while a few, such as the handsome *Meconopsis integrifolia*, are common on every alpine meadow and pass. Whatever may be said of the Himalayan forms, those of [Yunnan and S.E. Tibet] are found almost exclusively on limestone. Those that are scree plants grow directly on and in the limestone . . . where their long, fleshy roots work to a depth of as much as 3 ft.; whilst other species found on the ledges and in the crevices of cliffs, though possibly supported by a certain amount of humus, have many of their root fibres in direct contact with the limestone." (George Forrest in *Country Life*, LIV, 614, 1923.)

Forrest's numerous collections of 12 species and 2 varieties of this genus well illustrate his statement, for on the Li-chiang Range, a pure mass of limestone 50 miles long and 20,000 ft. high, he found 6 members of the genus: *M. Delavayi*, *M. Forrestii*, *M. horridula*, *M. integrifolia*, *M. lancifolia* var. *concinna* and *M. venusta*.

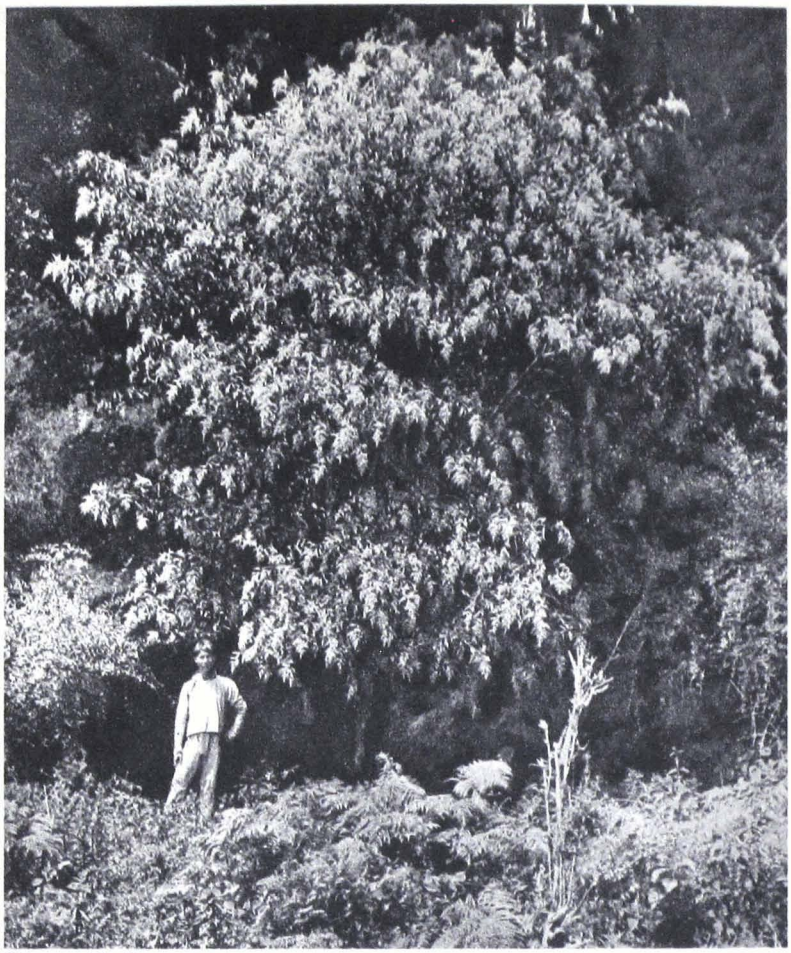
M. Delavayi, with its glaucous bluey-green leaves and solitary, deep blue-purple, satiny-sheened, nodding flowers borne on scapes 4–9 in. high is perhaps the finest of all the dwarf species. It is one of Delavay's discoveries of 1884 which Forrest rediscovered in 1906 and introduced seven years later. Forrest's first specimens of 1906 formed small scattered colonies along the base of a series of rugged limestone cliffs, but later in the year he met with it in greater abundance and luxuriance, at the higher altitude of 13–14,000 ft. in heavy alpine pastureland with *M. Forrestii* and *M. integrifolia*.

He endeavoured to introduce in 1914 *M. Forrestii*, one of his five valid new additions to the genus, but although his seeds germinated the plants did not reach the flowering stage. This was unfortunate for with the numerous nodding light purplish-blue flowers carried on 6–18 in. scapes, it is a very desirable species. The familiar sulphur-yellow flowered *M. integrifolia* first collected by Przewalski in Kansu in 1872 and the most widely distributed Meconopsis in Yunnan, and the polymorphic *M. horridula*, described in 1855 from Sikkim material and the most wide ranging species in the genus, are two plants of which Forrest gathered an abundance of seeds through which they were retained in culture.

Photo, G. Forrest

MECONOPSIS DELAVAYI IN YUNNAN

Of another plastic species, *M. napaulensis* which first flowered in Britain in 1852, Forrest introduced a very distinctive form with short cymes of flowers. His attempt to introduce, in 1905, what is apparently the only fragrant flowered species, *M. speciosa*, probably failed, for although plants were raised from his seeds there is no record of their ever flowering. And of *M. Georgei*, *M. pseudovenusta* and *M. venusta*, three closely allied species of which Forrest was the discoverer, there is no evidence of his seeds ever having germinated.



Photo, G. Forrest

MELIOSMA CUNEIFOLIA

Photo, R. Eudall

MEGACARPAEA DELAVAYI

MEGACARPAEA

Although members of the natural order Cruciferae did not figure widely in the collection, one that is worthy of notice is *Megacarpaea Delavayi*, a species first collected by Delavay in 1884 and described by Franchet.

Forrest's first collection was made in 1906 on the eastern flank of the Li-chiang Range and in later expeditions it was found in the Mekong-Salween Divide, in the mountains of Muli and on the Tali Range.

It is a showy perennial up to 3 ft. in height although normally reaching only about 2 ft. The several branching stems springing from the base bear many toothed or lobed pinnate leaves right up to the inflorescence which is made up of several racemes in the axils of the topmost leaves, each carrying many rose-lavender flowers about half an inch in diameter.

In 1910 and on subsequent journeys, a dwarfer plant was found and named *M. Delavayi* var. *minor*; it differs in the finer segments of the leaves, smaller flowers and deeper colour of the corollas. The type has been in cultivation for many years but there is no record of the variety *minor* having been introduced.

M. Delavayi is a not unattractive member of the order Cruciferae and has done well in the rock garden at Edinburgh. Anyone who doubts its inclusion in that order has only to taste its leaves which have the distinctive cabbage flavour.

MELIOSMA

Amongst the several members of the genus Meliosma found by Forrest in China, Burma and Tibet, two new species stand to his credit, one of which perpetuates his name. *Meliosma Forrestii* (F. 11744 type) said to be related to *M. dileniifolia*, but nevertheless distinct, was discovered growing in open forests, at an altitude of 7,000 ft., in the Ma-chang-kai Valley, Yunnan. A shrub or tree 30–40 ft. high, with large pubescent leaves up to 14 in. long, it bears pyramidal panicles of creamy yellow flowers. In the same locality, but at a higher level, Forrest gathered another *Meliosma* which has been named *M. dumicola* (F. 11879 type). Considered to be somewhat akin to *M. Fischeriana*, a species found on Mt. Omei in Szechwan, *M. dumicola* has a shrub-like habit and in certain respects is not unlike *M. Forrestii*, but has much smaller leaves and lacks the tawny indumentum which adorns the branchlets and foliage of the latter.

Of the old established species better known in cultivation, *M. cuneifolia* takes first place. Introduced from Szechwan by E. H. Wilson in 1906, it was found some years later by Forrest in Yunnan, high up on the south flank of the Li-chiang Range, growing as isolated specimens up to 30 ft. in height in the open or among the scrub, but nowhere common either there or in Tibet. The flowers, creamy-yellow at first, are ultimately pure white, with a scent like that of hawthorn, and according to Forrest "few of the deciduous shrubs in that area can compete with *M. cuneifolia* in grace of habit, wealth of bloom and delicacy of fragrance". This species is hardy in the south of England, but never attains the dimensions of a tree. It is one of the finest of the genus for horticultural purposes.

Certain Himalayan species of Meliosma occur also in W. Yunnan and Upper Burma, and these were recorded by Forrest. *M. pungens* is not uncommon over a wide area extending from Tengyueh northwards into Upper Burma and eastwards to the high plateau in the Yangtze Bend; while *M. simplicifolia*, found only in the Tai-ping Valley in Upper Burma, and *M. Wallichii*, which is confined to the Shweli-Salween Divide in W. Yunnan, show a more restricted distribution. The characteristics of each have been described elsewhere, but none is in cultivation and they are therefore less well known than *M. cuneifolia*. One other species, *M. glomerulata*, a native of the neighbouring province of Szechwan, has been found by Forrest also in Yunnan, in the region of Tengyueh.

NOMOCHARIS

The genus Nomocharis is closely allied to Lilium and Fritillaria and comprises about 14 species which are spread over W. China, S. E. Tibet, India and Upper Burma. Of the total number of species known, Forrest's collection contains ten and the number of specimens collected is well over seventy.

The first two species to be brought into cultivation by Forrest were *Nomocharis pardanthina*, first found by Delavay in 1883, and *N. Mairei*, two remarkable and beautiful plants. Both of these species flowered in 1914 in the Royal Botanic Garden, Edinburgh.

Only a few specimens of *N. pardanthina* were collected, the first being "on the margins of pine forests on the range forming the eastern boundary of the Li-chiang Valley" at altitudes in the region of 11,000 ft. In later years it was found on the Shweli-Salween Divide at similar altitudes. *N. pardanthina* is a plant up to 2½ ft. in height with leaves in whorls and with several flowers arranged at the apex of the stem and in the topmost axils. The pale to deep pink flowers measure as much as 2½ in. in diameter. *N. pardanthina* is closely allied to *N. Mairei* but the spotting is usually confined to the base of the segments of the corolla and not spread over it as in *N. Mairei*. *N. Mairei* and its varieties have been called the finest of the genus.

Forrest's first collection of the species dates back to 1906, when he also collected the pure white variety known as *N. Mairei* var. *candida*. Although the first discoveries were made in the Tali Range at about 12,000 ft. he found it in subsequent expeditions—in the mountains N.E. of Chungtien round Muli, at Yungning in S. W. Szechwan and in his last expedition at a number of other localities.

The remarkable character of *N. Mairei* is the fringed margins of the inner segments of the perianth. It grows up to 2½ ft. in height and bears at the top of the stem several flowers of a pure white or white-flushed pink spotted all over with a purplish-maroon.

A species which was brought into cultivation by Forrest and now named *N. aperta* was first discovered by Delavay and placed under Lilium by Franchet. Forrest's first material was named *Nomocharis Forrestii* as it was thought to differ from Franchet's species but with the collection of further material the two plants were found to be the same and the name *N. Forrestii* had to be dropped. *N. aperta* holds its flowers more erect than *N. Mairei*

Photo, G. Forrest

NOMOCHARIS APERTA IN THE WILD

R. M. Adam

NOMOCHARIS SALUENENSIS

and the flowers are pale-rose in colour spotted and blotched with deep crimson or crimson-purple. Pure white flowered forms without any spotting were found in Yunnan. *Nomocharis aperta* was sent home from several expeditions and has done well in cultivation.

Another very successful plant, *Nomocharis saluenensis*, was sent home by Forrest in 1921–22. A distinct species, it has one or two marked varieties, very variable in colour. Strong plants reach 3 ft. in height and the stems may carry as many as five flowers. Many collections were made of this species on the Bei-ma Shan, N.W. Yunnan, the Salween-Kiu-chiang Divide, Tsarong and the Mekong-Salween Divide, all at altitudes about 12,000 ft.

From the Mekong-Salween Divide and the Salween-Kiu-chiang Divide *N. meleagrina* was sent home, but it never succeeded in cultivation. It is closely allied to *N. Mairei* and *N. pardanthina.*

The species named in honour of Forrest, *Nomocharis Georgei*, discovered in N.E. Upper Burma in 1924 and 1925 on the western flank of the Nmai Hka-Salween Divide, was never raised in cultivation. Forrest's field notes described the flowers as "soft purplish-blue throughout, deepest on the exterior". It is closely allied to *N. Souliei*, another species which Forrest collected in the Mekong-Salween Divide and the Salween-Kiu-chiang Divide, Tsarong.

The remaining species—*N. basilissa*, *N. lophophora* and *N. euxantha*—were found in S. E. Tibet, N. W. Yunnan and W. Szechwan. *N. euxantha* was a new species similar in form to *N. nana* but with clear golden-yellow flowers. There is no record of it in cultivation.

OMPHALOGRAMMA VINCIFLORUM

in the Wild

Photo, G. Forrest

OMPHALOGRAMMA

The genus Omphalogramma is entirely Asiatic with its main area of distribution in N. E. Upper Burma, S. E. Tibet and N. W. Yunnan. All the species are centred in this area; but *O. Elwesianum* extends into Sikkim and Assam; *O. Souliei*, *O. minus*, *O. Forrestii* and *O. vinciflorum* extend to Szechwan, the latter penetrating into Kansu, and *O. Forrestii* into Assam. *O. brachysiphon* and *O. tibeticum* are apparently endemic to S. E. Tibet and *O. Farreri*, *O. Coxii* and *O. burmanicum* and *O. pilosum* to the Nmai Hka-Salween Divide in N. E. Upper Burma.

The Abbé Delavay discovered *O. vinciflorum* in 1886 in Yunnan, on the dividing range between the Lankiung and Hoking Valleys, at an elevation of 9–10,000 ft. The name testifies to the strong resemblance of the flowers to those of *Vinca major*. Delavay did not find the plant in any large quantity. Forrest on the other hand, twenty years later, discovered it in much greater abundance on parts of the eastern flank of the Li-chiang Range and at the higher altitudes of 11–13,000 ft. There it formed clumps of from 20–30 specimens, growing in sheltered grassy openings in pine forests, especially in situations having a northern exposure.

Throughout its wide range in Yunnan and Szechwan and its limited distribution in S. E. Tibet and Kansu, it is subject to much variation especially in the size and shape of the leaves and corolla lobes, and must be judged a very polymorphic species. It is unique in the genus by virtue of its lacking the thick woody rhizome typical of all the other species, and by being held in the ground only by a few large roots.

O. vinciflorum has proved to be more amenable in culture than any other species and has been in cultivation since Messrs. Bees introduced it from Forrest's seeds collected in the Li-chiang Range in 1908. On its first flowering, in Edinburgh, in 1913, it gained the Award of Merit. Small as these first flowers were, they were a foretaste of the superb blooms which in the course of a few years were to be seen in British gardens. For the rest, *O. Coxii*, *O. Forrestii*, *O. Farreri*, *O. Souliei*, *O. minus* and *O. elegans* have at one time or another been in European cultivation from Forrest's seeds; but except for the three latter—and even these have always been rare—all are long since lost. Plants grown under the name of *O. Delavayi*—one such gained an Award of Merit in 1936—have probably been *O. Farreri*. True *O. Delavayi* seems never to have been in culture.

ORCHIDS

The vast amount of Orchid material collected by Forrest brought to science many new species and established new records of the distribution of several of those species previously known only from India. The several hundred specimens belong to more than fifty genera. In addition to dried specimens plants were sent home but it is doubtful if any survive in cultivation today.

A new genus, allied to Pholidota was found and dedicated to the late A. K. Bulley, of Ness, Neston, Cheshire. This new plant, *Bulleyia yunnanensis* (F. 4879 type), was found growing on trunks of trees in moist forests in the Tali Range and is a plant of from 1–2 ft. with yellowish flowers.

Of the dozen species of Calanthe gathered, four were new, *C. amoena* (F. 8867 type), a plant of about 18 in. with maize yellow flowers; *C. lepida* (F. 19063 type) from the Salween-Kiu-chiang Divide, Tsarong, with stems a foot and more in height with pale rose blooms; *C. shweliensis* (F. 7824 type) to 2 ft. high with yellow flowers externally tinged with pink or lavender and *C. undulata* (F. 2345 type) olive-yellow with dull crimson labellum. Two very beautiful species collected were already known to science, *C. buccinifera* and *C. plantaginea.*

Among the new Cirrhopetalums collected is a remarkable species, *C. amplifolium* (F. 970 type), with a large broad leaf and very large sepals about 2 in. long, of a pale yellowish-pink deeply veined with purple. It was found growing on trees and cliffs on the banks of the Salween. From the hills west of Yunnan-fu (now Kunming) was sent the new *Cymbidium Forrestii* (F. 415 type) which was found growing in dry rocky pine woods at 9,000 ft. A distinct species related to the Japanese *C. virescens*, it has yellow and crimson in the flowers and with another new species, *C. pumilum* (F. 415 type), from Yunnan and Tibet is dwarfer than the usual type of Cymbidium.

The very popular and decorative forms of Dendrobium are well represented by about 15 species and while most of these are well-known Chinese plants, others are new records and there are 3 new species. *D. Bulleyi* (F. 1091 type) was collected in pine woods near Tien-ching-pu in W. Yunnan, a plant of a foot high with yellowish-white sepals and petals and a reddish-orange labellum veined darker. *D. scoriarum* (F. 8517 type) collected west of Tengyueh where it was growing as an epiphyte of 2 ft.

CYPRIPEDIUM MARGARITACEUM

Photos, G. Forrest

PLEIONE FORRESTII

in height. It is remarkable in its colouring—sepals yellow with a touch of red, petals yellowish-white and the labellum, the base of which is crimson-lake, centre pale yellow and apex crimson-lake. The third new plant was named *D. tapingense* (F. 12608 type) from the banks of the Tai-ping River, Upper Burma, an epiphyte of about 18 in., the flowers dull creamy-yellow with a flush of rose-pink. A very distinct Eulophia with solitary flowers was discovered among rocks in pine forests on the Tali Range and was named *E. monantha* (F. 11725 type). Only 6–9 in. in height, the flowers are an olive-green with brown markings. Several collections were made of *E. nuda*.

In the Shweli-Salween Divide, in the region of 7–8,000 ft., a new Galeola resembling the older *G. Lindleyana* was found in 1919. A stately plant of from 3–4 ft. in height it has fleshy flowers of creamy-yellow flushed with crimson, with the interior segments a dull crimson. It was named after its habitat—*G. shweliensis* (F. 18166 type).

Among the many plants sent home, one that flowered was an Eria. It had been collected in dry rocky situations on the lava bed west of Teng-yueh, Yunnan in 1912. This plant flowered at Edinburgh in 1914 and proved to be a new species. Allied to the Indian *E. bractescens*, it was named *E. obvia* (F. 8753 type); the flowers were maroon and white and the plant was upwards to 18 in. in height. Other beautiful members of this genus that were collected included *E. bambusifolia* and *E. convallarioides*.

During the expedition of 1906 and the later one of 1912, the genus Habenaria and the allied genera of Platanthera and Peristyles figured very markedly in the collections. Of those retained under Habenaria nearly all the known Chinese species were found, together with at least ten entirely new plants. Four of these commemorated the names of those people who were connected in some way with the expedition and the material—*H. Balfouriana* (F. 6149 type); *H. Beesiana* (F. 6406 type); *H. Bulleyi* (F. 895 type) and *H. Forrestii* (F. 2875 type). The latter three plants are closely allied and have small greenish flowers but *H. Balfouriana* is a notable species of 4–9 in. in height with large flowers of a greenish tinge. While *Habenaria multibracteata* (F. 8402 type) is another large flowered plant and grows up to nearly 2 ft. in height, the remaining *H. diceras*, *H. diplonema*, *H. glossophora*, *H. oreophila* and *H. roseotincta*, are small flowered. The known species collected included *H. Delavayi*, *ensifolia*, *glaucifolia*, *Orchidis* and *pectinata*.

The outstanding Cypripedium collected, while not new to science, was *C. corrugatum*, a Franchet species of remarkable colouring—the petals and sepals are yellowish-purple, veined deeper purple and the labellum purple-maroon: this was found several times both in Yunnan and Tibet. Two others were closely allied, *C. ebracteatum* and *C. margaritaceum*; the latter a magnificent plant with large leaves heavily spotted with purple and the petals and sepals a yellowish-green netted with purple-maroon and the labellum pale yellow with purple spotting; though only a few inches high the flowers are several inches in diameter.

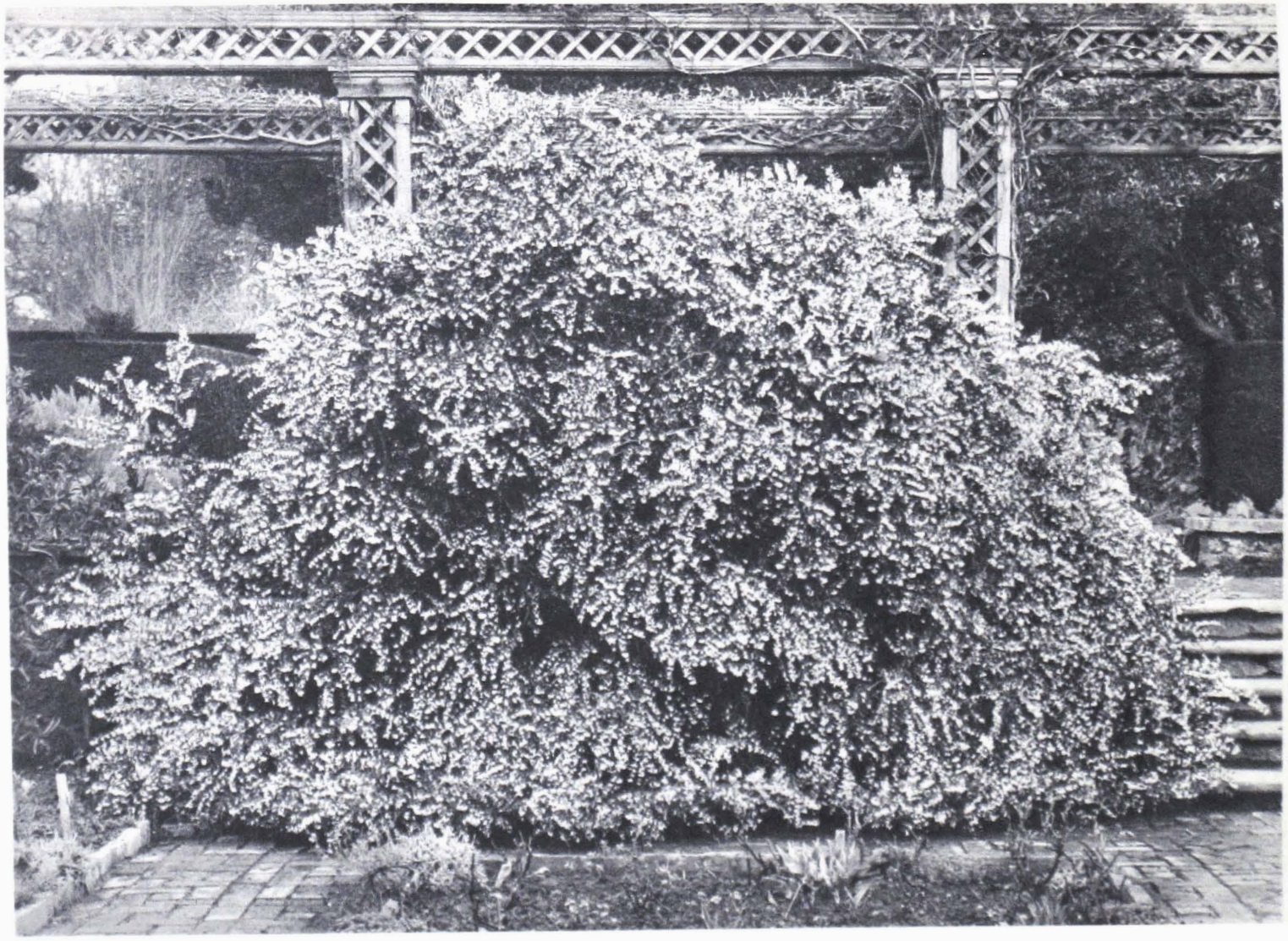
A very fragrant Bulbophyllum, described by Forrest to have "fragrance identical with that of Roman hyacinths", was discovered west of Tengyueh in 1912. An epiphyte on trees and rocks, it is of trailing habit with stem 2–3 ft. in length and pure white flowers slightly tinged with green. Allied to *B. odoratissimum* it has been aptly named *B. hyacinthiodorum* (F. 7987 type). Of the other new species of this genus, *B. shweliense* (F. 18398 type), is also an epiphyte on trees but is a dwarf plant of matted habit with golden yellow blooms, while *B. tibeticum* (F. 232 type), from the valley of the Mekong, is a small creeping plant of a few inches.

From the alpine meadows of Yunnan various Orchises were collected and while the bulk of them were known species, there proved to be new forms, the finest being *Orchis Beesiana* (F. 6464 type), a strong growing plant of upwards to 20 in. in height with deep rose flowers in a compact raceme; several of the specimens showing as much as 8 in. of flower head. In direct contrast to this is a tiny plant of 1 or 2 in. named *Orchis crenulata* (F. 5786 type) which has single flowers of purplish-rose.

Interesting new records were established by the collection of Coelogyne material and although none of the species were new to science, several were new to China. Among those collected in quantity there were such as *C. corymbosa*, *C. ochracea* and *C. longipes* from Upper Burma and Yunnan, also *C. barbata*, *C. flaccida*, and *C. prolifera* from Yunnan. The allied genus of Pleione proved just as prolific in new forms, two remarkable plants being considered new: *Pleione Forrestii* (F. 4859 type) which was found on moss-covered boulders and cliffs on the eastern flank of the Tali Range; only growing up to about 4 in. in height, it has flowers of a bright orange with brown markings. In later years it was also found in N. E. Upper Burma. Rather different in habit, *Pleione scopulorum* (F. 14230 type) is different in flower colour too, the flowers being scarlet-rose with the labellum of a darker shade. Other members of the genus found included *P. Delavayi*, *P. grandiflora*, *P. praecox*, *P. Henryi* and *P. yunnanensis*.

Other new species collected belonged to such genera as Hemipilia, Herminium, Liparis, Microstylis, Otochilus, Satyrium and Zeuxine.

OSMANTHUS DELAVAYI
at Bodnant



Photo, J. E. Downward

OSMANTHUS

During his many travels, George Forrest collected seeds of 3 species of Osmanthus; *O. Delavayi*, *O. Forrestii*, and *O. fragrans*, all plants worthy of a place in any garden. Closely allied to the Lilac and Jasmine, their flowers are enhanced by a sweet fragrance.

Perhaps not the most widely grown of the three, but, according to Forrest himself, one of the finest shrubs he ever saw, is *Osmanthus Forrestii*. In its natural home on the mountain slopes of Yunnan at altitudes between 8–9,000 ft. it seems to thrive in a variety of situations, having been recorded growing by the edge of streams, in the margins of forests and even amongst scrub on dry hillside slopes. The species has sweetly scented creamy white flowers, borne in the axils of its large spiny evergreen leaves. When planted in a good loamy soil, this shrub will attain a height of 10–15 ft.

The most popular species is *Osmanthus Delavayi* which owes its rapid distribution in this country to seed sent home by Forrest, although he was not the first person to discover it. He found it on the wooded mountain slopes of Yunnan and in certain areas on dry chalk. It is perfectly hardy and should be grown on a similar medium to *O. Forrestii*. This plant, which is of spreading habit, will grow to a height of 8 ft. and may be more than that in diameter. Very little pruning is necessary but when this is done it should be performed directly the plant has finished flowering. The white tubular flowers are produced in great numbers in terminal as well as in axillary clusters and are strongly scented. Elliptical with serrated margins, the dark box-like leaves dotted on the underside with minute oil glands, form a splendid background to the flowers. If propagation of this species be required, cuttings of half-ripened wood taken about the end of July will root readily if inserted in a frame and given a little bottom heat. An Award of Merit from The Royal Horticultural Society was received by the Hon. Vicary Gibbs for his exhibit of *Osmanthus Delavayi* on April 7th, 1914.

Noted for its delicious perfume, *Osmanthus fragrans* is more a subject for the greenhouse than for outdoor culture. Flowering from June until August, it has large broad leaves in the axils of which are set the white or cream coloured flowers. It is very common in Szechwan where it is extensively grown in the courtyards of the temples, the priests making use of it as an offering because of its strong scent.

PAEONIA

Of the 9 species of Paeonia occurring in China, 3 only, all shrubby, were collected by Forrest—*P. lutea*, *P. Delavayi* and *P. Potanini* and its variety *trollioides*.

The reddish-flowered *P. Potanini* was first found by Potanin in the Tatsienlu District in 1893, and Forrest collected it in the hills around Yungning on his third and fifth expeditions. In 1914 he met with the yellow-flowered variety on the Bei-ma Shan, and subsequently introduced it. It is an erect plant and like the type species increases rapidly by stolons.

Delavay, once again first in the field, discovered and introduced both *P. Delavayi* and *P. lutea*. The latter, a plant of up to 4 ft. or more with yellow flowers blotched with red or purple at the base of the petals, he found around Hee-chan-men, Tapin-tze and Tali in 1883. Plants from his seed were raised by the Paris Museum and first flowered in 1891, and for the following two years plants were shown by the National Society of Horticulture of France. When exhibited at The Royal Horticultural Society in 1903 by Mr. Potten of Kent, who flowered it in a cold frame, this species was awarded a First Class Certificate.

The year after his discovery of *P. lutea*, Delavay gathered *P. Delavayi* on the Li-chiang Range and plants raised from his seed were exhibited at a flower show in France in 1892. This fine plant with handsome foliage and wonderfully-scented semi-pendulous dark crimson flowers is the only one in the genus with an involucre of bracts immediately below the inflorescence. Plants exhibited by Col. F. C. Stern, monographer of the genus, gained an Award of Merit in 1934.

The 2 species, *P. Delavayi* and *P. lutea*, seem to hybridise freely in the wild for Forrest records in the *Gardeners' Chronicle* of 1920 that ". . . 50% or more (of *P. lutea*) bore blooms either blotched with deep crimson at the base or flushed throughout with a most unsightly shade of dull, brownish-orange". It appears that the product of these two attractive species is not itself a thing of beauty.

Nevertheless, the numerous prophecies of the early 1900's regarding the potentialities of *P. lutea* in the hands of the hybridist have certainly been fulfilled. For P. x "L'Espérance" (*P. lutea* x *P. suffruticosa*), a semi-double paeony, gained an Award of Merit in 1913 for Messrs. Kelway, Langport, and a First Class Certificate in 1931 for Hiatt C. Baker of Bristol.

Photo, G. Forrest

PARAQUILEGIA ANEMONOIDES

PARAQUILEGIA

In 1920 when Drummond and Hutchinson created the new genus Paraquilegia, as distinct from Isopyrum, they enumerated 4 species which previously had been included in Isopyrum—*P. caespitosa*, *P. uniflora*, *P. microphylla* and *P. grandiflora*, the correct name of which, as Ulbrich has shown, should be *P. anemonoides*. Our concern is with the two latter.

Although Forrest mentioned *P. anemonoides* in literature and a photograph of it *in situ* was published (under the name of *I. grandiflorum* of course), all his material from Yunnan, Szechwan and S. E. Tibet was in fact determined as *P. microphylla* by Drummond and Hutchinson and by others. Outwardly these Forrestian gatherings may be separated fairly easily from *P. anemonoides* by their smaller, more dissected leaves. The fundamental difference between the 2 species lies in the seed, which is markedly papillose in *P. anemonoides*, smooth in *P. microphylla*. Some plants, however, with the leaves of *P. anemonoides*, gathered by Forrest and by Rock in Yunnan and Szechwan, have the smooth seeds of the smaller-leaved species, which species they should then undoubtedly be. Thus as one cannot rely entirely upon the leaves as a criterion of distinction, plants which are not in fruit cannot be determined satisfactorily.

The distribution of these two closely allied species is of some interest. Both are common to Kashmir. *P. anemonoides* extends further north into Afghan and Chinese Turkestan and eastwards into Kansu, where Rock gathered it frequently. *P. microphylla* is found further south in Yunnan and Szechwan whence the former species has not been recorded. Thus, though there is an overlap in their Indian distribution, elsewhere their geographical range is quite distinct.

No matter the view adopted of the taxonomy of the Yunnan and Szechwan plant, it is unquestionably one of the finest Forrest ever collected. It is a denizen of cliff crevices where it forms compact cushions, which in Forrest's gatherings are up to 16 in. in diameter, and covered with flowers ranging in colour from pure white to lavender-purple. Forrest said that it was "the finest cliff plant of the whole range . . . a real gem, though of extremely slow growth, a cliff alpine, only to be seen in the most inaccessible chimneys and clefts".

Dr. George Taylor recently wrote of its exquisite beauty thus. "I shall never forget my amazement on seeing *Paraquilegia anemonoides* for the first time, and indeed for sheer delicacy, poise and refinement this plant must be supreme. I was stung by its perfection as it hung in aged tufts from dry overhanging rocks, the glaucous leaves a beautiful foil to the tremulous pale lilac flowers." Little wonder then, that this plant, under the name *P. grandiflora*, gained the Award of Merit from The Royal Horticultural Society in 1932 for G. P. Baker of Sevenoaks. It is a delicate plant, however, best suited to the alpine house or scree frames.

PARASYRINGA SEMPERVIRENS

From a coloured drawing by Miss L. Snelling
in "Curtis's Botanical Magazine", t. 9295

PARASYRINGA

The monotypic genus Parasyringa, an anomalous member of the Oleaceae, is a native of the Chinese provinces of Yunnan and Szechwan. Discovered some seventy years ago by the Abbé Delavay in the mountains above Tapin-tze, north-east of the Lake of Tali, this shrub was first described by Franchet in 1886 under the name of *Syringa sempervirens*, although in its general appearance, evergreen habit and in the nature of the fruit it did not agree with the current conception of a Syringa. So aberrant was it that Franchet was compelled to add a further Section (Sarcocarpion) to the genus to accommodate this new species from W. China.

During 1906 and 1913 Forrest rediscovered this plant and found it on several occasions on the Li-chiang Range and Yungpei Mountains. The specimens he collected in flower and fruit were subjected to a critical analysis with the result that a new genus, Parasyringa, was established by Sir William Wright Smith, the original specific name being preserved. The chief characters for the exclusion of this Delavayan plant from Syringa are the evergreen, coriaceous foliage, the more or less fleshy mesocarp of the fruit and the usually single wingless seed. The fruit of *Parasyringa sempervirens* is black, oblong in shape and dehisces when mature to release the seed, or seeds, a peculiarity of the genus which is not however, always so obvious in cultivated plants, owing to the delayed ripening of the fruits. Apart from the distinctive character of the fruit, Parasyringa in its floral structure, as well as in its habit, bears a superficial resemblance to a Privet, so much so in fact that Lingelsheim in 1924 reduced it to Ligustrum, and in Mansfeld's classification of the Privets it appears in a special section of the genus as *Ligustrum sempervirens*.

It is by the name *P. sempervirens*, however, that this handsome compact shrub, with persistent glossy deep green foliage and panicles of creamy-white fragrant flowers, is best known in parks and gardens in this country, and it is to Forrest that we are indebted for its introduction into cultivation more than thirty-five years ago.

Grown first in this country at Caerhays Castle, Cornwall, from seed gathered by Forrest in Yunnan, *P. sempervirens* has since proved to be hardy in most parts of the British Isles, though requiring winter protection in some districts. On several occasions fine specimens in full flower have been exhibited at meetings of The Royal Horticultural Society, and in August 1930 an Award of Merit was granted by the Society when elegant sprays of *Parasyringa* from Duffryn were displayed by the late Reginald Cory.

PIERIS

The genus Pieris of which George Forrest collected eight distinct species in Yunnan, Upper Burma and Tibet, horticulturally ranks high among Ericaceous genera. All the species are spring flowering trees or shrubs. The clusters of flower buds formed during late autumn remain dormant during the winter months and in the following April or May the lantern shaped corollas are rapidly developed. Like most other members of their family they demand a lime-free soil for their successful cultivation and flourish in loamy or peaty soil. Except for this they ask for no other special treatment.

Surely the most striking of the old world species is *Pieris Forrestii*, a plant about which very little information is available. It was raised in this country from seed sent to Bees and the Royal Botanic Garden, Edinburgh. In his *Botanical Magazine* article, Airy-Shaw (t. 9371) discusses it as a variety of *Pieris formosa*, a plant widespread from Nepal to Yunnan and Hupeh, but the latest Kew Hand List (1934) still recognises its specific rank. *P. Forrestii* is said to differ from *P. formosa* in having larger flowers and distinctly exserted styles. Its most attractive feature is the brilliant scarlet young foliage which supplies the plant with an impression of autumn tints through the earlier part of the growing season. The alternate leathery leaves which measure from 1½ to 3 in. long and up to three-quarters of an inch wide are glabrous and shiny with finely serrated margins. *P. Forrestii* is very floriferous and the pink-white flowers are borne in terminal panicles. An Award of Merit and a First Class Certificate have been gained by this species.

Two new Forrest introductions are *Pieris bracteata* which has white flowers tinged with rose and *P. macrocalyx*, a shrub up to 8 ft. high with flowers which are pure white to creamy-yellow.

At an altitude of 6–10,000 ft. grows *Pieris formosa*, a shrub up to 20 ft., while from Tibet, Upper Burma and Yunnan comes *P. doyensis* where it spreads through the open forests.

Pieris japonica grows to a height of from 2–9 ft. in semi-shaded situations and is an Award of Merit plant. Growing together in Yunnan at altitudes of 4–11,000 ft. are *P. villosa* and *P. ovalifolia* with its two varieties *elliptica* and *lanceolata*, all having white flowers.

Colour Photo, J. E. Downward

PIERIS FORRESTII

At Windsor Great Park

POLYGONUM

Among the fifty or so species of Polygonum which Forrest collected, eight were new to science. Since then, however, *P. jucundum* has been equated with Léveillé's *P. Dielsii* and in any case Meisner had used the name *jucundum* in 1826 and his species still stands. *P. oliganthum* was regarded as a synonym of *P. hastatosagittatum* by Gunnar Samuelsson in his review of the Chinese Polygonaceae (Symbolae Sinicae, p. 182). In the following year Albert N. Steward published his monograph, *The Polygonaceae of Eastern Asia*, in which he reduced Makino's species to a variety of *P. strigosum*. *P. oliganthum*, therefore, is now *P. strigosum* var. *hastatosagittatum*. A third new species, *P. lichiangense* was known by this name for many years, but Steward reduced it to a variety of the Himalayan *P. campanulatum*, giving as his reason the greyish tomentum on the under surface of the leaves and the pubescence set in basal glands on the upper surface. Be that as it may, the two are very distinct, for the under surface of the leaves of *P. campanulatum* is an unmistakable buff colour, and the inflorescence of *P. lichiangense* is much larger and more floriferous. Whether regarded as a species or as *P. campanulatum* var. *lichiangense*, its presence in our gardens is no less welcome. Although introduced through Forrest's seed, this plant also entered the country by a less orthodox route. When living plants of *Primula sonchifolia* were sent to Britain by steamer in 1931, packed inside bamboo "pots", a stranger amongst them was flowered by Mr. Tom Hay and identified as *Polygonum lichiangense*. As such it won for him The Royal Horticultural Society's Award of Merit in 1933.

What of Forrest's new and still valid species? There is *P. leptopodum* with narrow spikes of white flowers; *P. calostachyum* with long leathery leaves and deep crimson flowers; *P. subscaposum*, characterised by large broad leaves with a buff-coloured tomentum on the underside, and by bright pink or red flowers; and *P. Forrestii*; all were discovered between 1904 and 1906 and none of them is in cultivation. The failure to introduce the charming *P. Forrestii* is a tragedy. Forrest collected it eleven times from Yunnan and Tsarong at altitudes of from 9–14,500 ft.; Rock and Ward also met with it on several occasions. Its beauty is striking even in a dried state. Never really attaining a height of more than 12 in., the plant has densely crowded corymbose panicles of white or creamy-white flowers, and suborbicular basal leaves. It is a stoloniferous perennial and in its natural habitat favours a moist situation whether in alpine meadows or amongst stones. In either of its forms, as a high altitude dwarf plant of 1–4 in. or as a taller plant, it would doubtless be a favourite Polygonum if it could be brought to our gardens.

Photo, R. A. Malby

PYRACANTHA ROGERSIANA

Photo, R. M. Adam

PYRACANTHA CRENULATA

PYRACANTHA

Of the three Asiatic Firethorns which are contained in his collection Forrest introduced only one, the plant which is variously known in gardens as *Pyracantha Rogersiana* or *P. crenulata* var. *Rogersiana*. It was originally described in 1916 under the latter name from material grown by the late Mr. C. Coltman Rogers of Stanage Park, Radnorshire. Mr. Rogers raised his plants from Forrest's seeds which he had received from the late Mr. J. C. Williams of Caerhays Castle. A. B. Jackson's account of Mr. Rogers' plant (*Gard. Chron.* 60, 309, 1916) omits to state the Forrest number under which it was grown. Similar plants were raised at Kew at this time, from Forrest seed also received from Mr. Williams in 1911 under the number F. 5984. But as Forrest's field specimen of 5984 is *Ligustrum compactum* there was clearly some confusion of numbers. Forrest's herbarium does not help us to unravel the confusion for there are no fruiting Pyracantha specimens contained therein prior to 1911. And yet on the herbarium sheet of the flowering specimen of our plant F. 5597 taken in the Li-chiang Range at 8,500 ft. elevation in May 1910, there is this annotation, written by Forrest in pencil, "Fruit golden yellow or scarlet? 2 species".[1]

Whatever view one takes of the taxonomic status of F. 5597—whether one regards it as merely a varietal state of the Himalayan *P. crenulata*, as did Rehder, or as meriting a specific rank as did Stapf and more recently Sealy, there is no gainsaying the fact that it is an eminently desirable shrub both for the shrub border or for the wall, being perfectly hardy and easy to grow with the minimum of attention. As the easily raised seedlings vary considerably this plant is best propagated by cuttings which can be rooted without difficulty. Young plants hate disturbance and should be established in pots for planting out. Not only has *P. Rogersiana* received the Award of Merit but the two colour-fruited forms which Forrest expected might prove two distinct species—the yellow berried *f. flava* and the orange-yellow or red berried *f. aurantiaca*—have gained The Royal Horticultural Society's First Class Certificate.

The other two species of Pyracantha which Forrest collected were both introduced to cultivation by M. Maurice de Vilmorin. *P. angustifolia* which Forrest gathered in the Li-chiang Valley a month after he found *P. Rogersiana*, was raised from seed forwarded to France by Soulié in 1895; whilst *P. crenato-serrata*, which Forrest collected in the Tali Valley, was said to have been sent to France by Ducloux in 1910.

[1] Perhaps it is as well to record that this is not the only mixing up of field numbers in this genus. In 1915 Messrs. Bees Ltd. were cultivating under the number F. 5804 what is obviously *P. crenato-serrata* and yet the herbarium specimen of F. 5804 is quite obviously *P. angustifolia*.

Photo, G. Forrest

RHEUM ALEXANDRAE IN YUNNAN

RHEUM

Of the 7 species of the genus Rheum collected by Forrest, *Rheum Alexandrae* is certainly the most distinct and decorative. Forrest gathered this comparatively rare species on three occasions, 1913, 1917, and 1924. It inhabits the moist open limy pastures and windswept ridges of N.W. Yunnan and Tibet at altitudes of from 10–14,000 ft.

Rather reminiscent of a bolted lettuce and yet, for a Rhubarb, quite spectacular, *R. Alexandrae* owes its attraction not to the flowers, but to the large, crinkly, creamy-yellow flower bracts which rise in tiers to a height of from 2–5 ft. and protect the flowers and subsequently the young fruits from the ravages of wind and weather. The bracts quickly wither when the fruits are mature and thus the latter are exposed to the wind for dissemination.

Wilson discovered the plant and his sponsors, the firm of Veitch, introduced it to European culture in 1909. As it has never prospered in cultivation it is rarely seen in gardens today. This is unfortunate for though cultivated plants never attain the size produced by those flowering in their natural habitat, the species does form an attractive and original addition to the garden. There are, however, established plants at Bodnant and at the Royal Botanic Garden, Edinburgh, where it is successfully grown in very moist soil at the edge of the pond.

Other species gathered by Forrest include *R. officinale*, a plant from 2–8 ft. high found in Yunnan and E. and S.E. Tibet at altitudes of 9–10,000 ft. This plant supplies the Turkey Rhubarb long famed for its medicinal properties and was described in a work dedicated to Emperor Shen-nung, the father of Chinese horticulture and medicine, as long ago as 2700 B.C. It was also seen and described by Marco Polo, one of the earliest Europeans to view it growing in its natural habitat.

Forrest also collected *R. acuminatum*, the Sikkim Rhubarb, which bears so close a resemblance to *R. Emodi* that at one time they were considered to be the same species. *R. acuminatum* is found on stony meadows and cliff ledges at altitudes of from 9–13,000 ft. in Yunnan, Upper Burma and the alpine regions of the Himalayas of Sikkim and E. Nepal. One of the attractive features of *R. acuminatum* is the deep blood-red colour of the flowers and fruits.

Bearing the collector's name is a lesser known white flowered species, *R. Forrestii*. It is a plant 2–3 ft. high inhabiting open stony pasture and rocky clefts at altitudes of 9–11,000 ft. on the eastern flank of the Li-chiang Range, where Forrest first collected it in July 1906.

RHODOLEIA
FORRESTII

From a coloured drawing by Miss S. Ross Craig in "Curtis's Botanical Magazine", New Series, t. 27

RHODOLEIA

The genus Rhodoleia belongs to the Hamamelidaceae and contains only 7 species, all of comparatively limited range and conveniently divisible into two geographical groups. Of the southern group, *R. ovalifolia* and *R. subcordata* are confined to a small area in the Malay Peninsula whilst *R. Teysmanni* is more widely distributed throughout the western and central states of the Peninsula as well as in Sumatra. Of the northern group *R. Championii* is endemic to Hongkong and *R. Henryi* to Yunnan. *R. parvipetala* and *R. Forrestii* are also Yunnan species, with the former ranging into Kwangsi and French Indo-China and the latter into N. E. Upper Burma.

It was in N.E. Upper Burma on the Nmai Hka-Salween Divide at Hpimaw that Farrer found *Rhodoleia Forrestii* in April 1919 "at first sight mistaken for a Rhododendron". And it was also in April 1919 when Forrest met with the plant, though on the Chinese side of the same pass, " a tree of 40 ft. . . . flowers red crimson . . . mixed forest". Unfortunately both Farrer's and Forrest's gatherings were confused with the Hongkong species and were named *R. Championii.* It is quite evident, however, that Farrer was a little dubious of this identification for on the field ticket of his F. 1533 gathered at Nyitadi the following year he wrote—"*R. Championii*? But the leaves seem too small and not glaucous beneath but softly velvety." It is exactly this character of the indumentum which so impressed Professor Chun and caused him to write on the Kew sheet of Forrest 26589, "*R. Forrestii* sp. nov."; and it is this same character which is used by Exell in demarcating the 2 species in *Sunyatsenia* Vol. 1., p. 96–97, where he formally described *R. Forrestii* in 1933.

This much debated plant was introduced to British cultivation in 1920 by both Forrest and Farrer although as we have shown, for thirteen years it masqueraded under the name *R. Championii.* It is unfortunate that so handsome a member of the Hamamelidaceae appears to be hardy in only the mildest parts of the British Isles, as for instance in the Cornish garden of Mr. M. P. Williams at Lanarth. There, one plant of the species believed to have been grown from Forrest's seeds first flowered in 1938. Material from this plant gained Mr. Williams a Botanical Certificate from The Royal Horticultural Society in 1945 and furnished material for the *Botanical Magazine* figure (N.S.t. 27) in 1948.

Photo, G. Forrest

ROSCOEA PURPUREA

Photo, D. Wilkie

ROSCOEA HUMEANA

ROSCOEA

There is no doubt that *Roscoea Humeana* is the finest of the Roscoeas in cultivation. Plants raised from seed, sent by Forrest from Yunnan, first flowered in Edinburgh in 1912, and the new species was described by Professor Sir William Wright Smith in the *Notes from the Royal Botanic Garden, Edinburgh* IX, 122, 1916. The name, it may be mentioned, commemorates David Hume, a young gardener on the staff at Edinburgh who fell in the retreat from Mons in August 1914. It was a happy idea to name a plant after each of the members of the staff who were killed in action in the early days of the first great war; the well-known *Buddleia Fallowiana* is another so named.

This unusual plant, *Roscoea Humeana*, perfectly hardy in our temperate climate although belonging to the tropical family Scitamineae with ginger, banana and arrowroot, is remarkable for its manner of growth and the difference in its appearance early and late in the season. Shoots arise each year from a perennial underground stem and the flowers, which are large, violet to bluish purple, appear, 4–5 at a time, in May and June, when the plant is only 6–9 in. high and before the leaves have expanded. Eventually, when the plant reaches maturity in August, it is 2–2½ ft. in height, with leaves as much as 1 ft. 8 in. long and 3 in. broad, and still, at this stage bearing a few flowers.

Roscoea Humeana gained the Award of Merit from the R.H.S. in 1920 and the Alpine Garden Society's Award of Merit in 1932.

This is not the only species of the genus represented in our gardens by plants raised from Forrest's seed; there are certainly several others. But because the Roscoeas look so different in the various stages of their growth and, because of colour variations of the flower, sometimes yellow sometimes purple, considerable confusion in nomenclature has resulted. Therefore, it is not easy to detail our debt to Forrest for new species, and readers are referred to the Review of the Roscoeas (New Flora and Silva x, 17–28, 1938) where the question is discussed.

The well-known *R. cautleoides* should be mentioned. It is described "as of quite singular loveliness, its flowers a yellow unparalleled in the garden, uniform, soft and clear". There is a corresponding form with deep rich purple flowers known as var. *purpurea*; both are common, as Forrest informed us, on the Li-chiang Range at altitudes of 9–10,000 ft.

Another, which we have also from Forrest's seed, grown under the name *R. alpina* (the typical plant from Kashmir and Nepal has reddish or reddish purple flowers and was long ago introduced to cultivation) is an attractive plant with one or more flowers of a bright strawberry pink.

The allied *Cautleya lutea* is the only plant in the same family, other than the Roscoeas, which is hardy and common in cultivation and this too, Forrest found in Yunnan.

SALVIA

The very extensive collection made by Forrest of the genus Salvia in Yunnan contains about seventy specimens and includes many new species and varieties. While a number of these new species are of botanical rather than horticultural value, others have proved suitable plants for the herbaceous border and have remained in cultivation.

One of the first of the new species to be discovered was *S. trijua* (F. 65 type) which was found in the Teng Chian and Sung-kwei Valleys in 1906, and later on the eastern flank of the Li-chiang Range. Other collections were made north-east of the Yangtze Bend and on the Mekong-Salween Divide, mostly in the region of 10–11,000 ft. It grows on dry chalky pasture and may reach a height of 1½ ft. There is a wide range of shades in flower colour—rose-lavender, deep purple, and pale violet.

Early expeditions included several other new plants. *S. Bulleyana* (F. 4546 type) is a vigorous growing plant of over 2ft. with many stout shoots carrying yellow to rose coloured blooms, with deep purplish markings on the upper lobe of the corolla. It was collected at various places on the Tali and Li-chiang Ranges. In the same areas *S. castanea* (F. 2938 type) was found, a species with purplish-maroon corolla, reddish-yellow at the base. A very beautiful plant growing to as much as 3 ft. in height was named *S. hylocharis* (F. 2394 type); the flowers are rich yellow with the lower lobe of the corolla a deep violet.

From the eastern flank of the Li-chiang Range at Sung-kwei was sent home seed of *S. digitaloides* (F. 2031 type), a densely hairy plant of less than 1½ ft. with yellow flowers marked with violet.

One of the finest of Forrest's Salvias was *S. Evansiana*. Found in the early expeditions, it was distributed as *S. hians* and was described by Handel-Mazzetti in 1925. It resembles in some ways the Indian *S. hians* and has violet to purple flowers with creamy-white on the tip of the corolla.

Many collections were made of *S. yunnanensis* from the Li-chiang Valley, Tali Range and the Salween-Yung-ch'ang Divide; the flower colour varies from rich blue to deep purple.

Other new species of Salvia described from Forrest's material are *S. grandifolia* (F. 11150 type), *S. pauciflora* (F. 18985 type), *S. schizocalyx* (F. 26856 type) and *S. subpalmatinervis* (F. 30845 type).

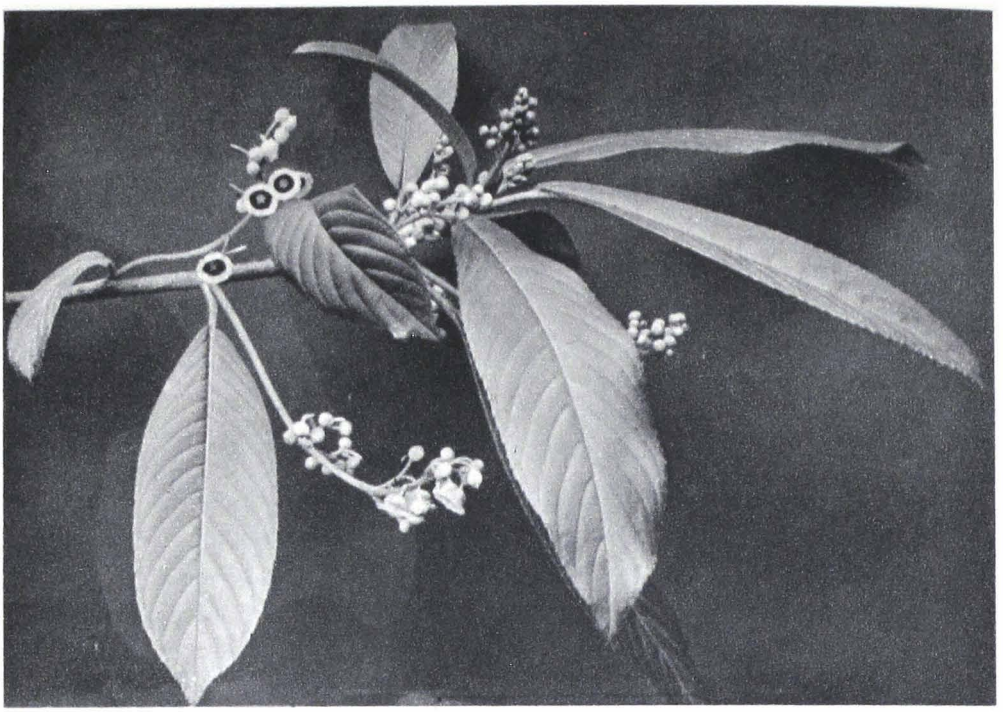
SAURAUJA

Species of Saurauja are seldom seen in cultivation and so we may well say that *Saurauja subspinosa* is a plant to make us increasingly aware of our debt to those gardens which can still maintain rare botanical collections. In such gardens lies our only opportunity of admiring the graceful beauty of *S. subspinosa*. Its wealth of drooping flowers—a delightful rose-pink with deep crimson interior—borne in loose panicles, and its free branching lax habit, combine to make it a rewarding plant for the discriminating cultivator who nurtures it in temperate house or conservatory conditions, which suit it admirably.

Forrest made four gatherings of this plant. In September 1924 he gathered his F. 25084 from which seed the first cultivated specimen was grown. In November of the same year he collected F. 25970 which Anthony designated as the type of the species. In May and October of the following year he made further gatherings under F. 26579 and F. 27366. His field notes state that he found it on the margins of thickets and among scrub near Htawgaw and in N. E. Upper Burma at a height of 6–8,000 ft. Unlike its close ally, the wide ranging *S. napaulensis*, *S. subspinosa* would appear to be of very limited distribution, strictly confined to two areas in Upper Burma. A specimen collected by Kingdon Ward in the Delei Valley of Assam and at first believed to be the Burmese plant, should now be more correctly interpreted as possibly a form of *S. macrotricha*.

S. subspinosa has never become a popular plant due, no doubt in some measure, to the difficulty in germinating the seeds of these early collections. According to Professor Sir William Wright Smith, seeds of the Asiatic species sent home were usually not viable. Notwithstanding this the late J. C. Williams of Caerhays successfully raised one plant from F. 25084, a most worthy achievement. This specimen was acquired by the Edinburgh Royal Botanic Garden in 1928. The stock has been increased so that the Garden now possesses several specimens, one of which has attained a height of 10 ft. and flowers freely for several months of the year in the Rhododendron House.

Forrest also sent home several gatherings of *S. napaulensis*, the fruits of which are mealy and edible and are freely eaten by the Nepalese. Two other species he collected were *S. punduana* and *S. Roxburghii*.



Photo, D. Wilkie

SAURAUJA SUBSPINOSA

Photo, R. Eudall

SORBUS HARROWIANA

SORBUS

Much has been written about the plants which furnish our gardens with autumn tints, but how fascinating and exciting it must be to see a whole wood of a single particularly colourful species. That must surely be a very rich experience for the plant collector and one George Forrest must have savoured innumerable times.

Sorbus is one of the many genera noted for this colourful display. Although the genus is a large one and widely distributed, China seems to possess a far greater number of species than any other country. In fact, the collecting areas covered by the Forrest expeditions yielded 24 distinct species. Well-known species, such as *Sorbus Rehderiana*, *S. Vilmorinii*, *S. Prattii*, *S. poteriifolia*, and *S. oligodonta* are all included in the collection list.

One of the three new species introduced into cultivation by Forrest is *S. Harrowiana* (F. 9040 type), a species with entire leaflets, which according to the original description, sometimes exceed 8 in. in length and have shiny upper surfaces. The creamy white flowers of spring are followed in autumn by very small white fruits which measure only an eighth of an inch in diameter. However, the many brilliant shades to which the leaves turn during the latter season, more than compensate for the lack of brightly coloured fruits. *S. Harrowiana* grows to a height of from 10–40 ft. in Yunnan, E. Tibet and N.E. Burma, at altitudes ranging from 8–12,000 ft. There it forms shrubby thickets on the rocky slopes and reaches tree dimensions in the more favourably sheltered situations. This species was named in honour of Mr. Robert Lewis Harrow who for twenty-nine years, from 1902 until 1931, was Curator of the Royal Botanic Garden, Edinburgh.

The two other new species introduced, *S. filipes* (F. 16704 type) and *S. pteridophylla* (F. 16682 type) also belong to the section with divided leaves. *S. filipes* has crimson flowers and red fruits and flourishes in open situations in Yunnan and S. E. Tibet. The fern-leafed Sorbus, *S. pteridophylla* with light crimson fruits and creamy white flowers has a shrub-like habit and frequents the rocky slopes of Yunnan between 9–13,000 ft.

Both *Spiraea yunnanensis* and *S. virgata* were discovered by Delavay, near Mo-so-yu, above Lankiung, in Yunnan, in 1884. Forrest not only rediscovered them on the Li-chiang Range, the former in 1910 and the latter in 1906, but introduced both of them into British gardens.

Forrest 5580 was made the type of a new species, *S. sinobrahuica*, and thus it was under this name that *S. yunnanensis* in 1923 was first, and possibly still may be, cultivated. It is of course a splendid shrub of from 4–7 ft., with the young shoots covered with tawny down, with the broadly ovate or obovate leaves lobed and toothed in the upper part and densely white or greyish tomentose below, and with pubescent umbels of fairly large creamy white flowers. Forrest found the plant not only on the Li-chiang Range, but also when descending from this range to the Yangtze Valley, as well as on the mountains of the Salween-Kiu-chiang Divide. Here there grows an expression of *S. yunnanensis* with dwarf compact habit, known as var. *aridicola*, which had been gathered in the arid regions of the Yangtze by Kingdon Ward in May 1913, a month before Forrest first saw it. And on the mountains of the Lankiung-Hoking Divide, *S. yunnanensis* var. *siccanea* is a much less hairy form of the typical plant.

The graceful *S. virgata* with slender spreading branches covered with dense clusters of white flowers was introduced to culture in 1908, the year in which Wilson found the plant in W. Szechwan, though his specimens were described by Rehder as a new species with the name *S. myrtilloides*. Likewise it would seem that *S. canescens* var. *glaucophylla*, found by Delavay near Tali in 1886, should also be regarded as synonymous with *S. virgata*. At any rate, Forrest's specimens demonstrate a series of gradual transitions from the simple umbel-like raceme of *S. virgata* to the typical compound raceme of *S. canescens* var. *glaucophylla*.

In 1910 from the dry crevices of the limestone cliffs of the Li-chiang Range, Forrest took his only gathering of *S. calcicola* (F. 5730 type), a very lovely shrub with very small obovate leaves at most $\frac{1}{6}$ in. long and with clusters of flowers, white tinged with deep rose, all along the gracefully arching branches. It has been in gardens since 1915 but is still a rare plant. *S. lichiangensis* (F. 10158 type) is Forrest's only other new species. Known only in the wild, it is a very floriferous and charming plant, with ovate leaves about an inch long and broad, and with racemes of a few fairly large flowers, white stained with rose.

As for the rest of Forrest's Spiraea collections, the most important are *S. arcuata*, *S. bella* and *S. canescens*, Himalayan plants which have long been in cultivation and the distribution of which Forrest extended into Yunnan.

SYRINGA

Among the Syringa species widespread throughout the Szechwan and Yunnan Provinces of N.W. China *S. yunnanensis* is one of the finest. Forrest found it growing in open scrub and on hillsides and now and again in open pine and oak forests of the Salween-Kiu-chiang Divide. Before Forrest botanised in these localities, this species was known only by a few herbarium specimens sent home by the Abbé Delavay. These were described by Franchet and are now in the Museum of Natural History in Paris.

It was not until 1906, when Forrest sent home a collection of seeds, that this species was first introduced into cultivation. Plants raised from this and from many other gatherings have shown it to be very variable with regard to flower colour, but in its dark purplish-rose form it is a truly worthy acquisition to horticulture.

In habit of growth *S. yunnanensis* forms a shrub up to 10 ft. in height which tends to look spindly and drawn, producing young growths up to 4 ft. long in one season, but, unlike members of the *vulgaris* section it has not the untidy habit of suckering, and this in itself is a recommendation. The flower trusses, which are produced in June, can measure 9 in. in length and 5 in. across, while the delightfully scented flowers range in colour from purplish-rose to almost white. Whatever the original shade may be, however, the flowers gradually fade until they become bleached of almost all colour before withering.

Due to its long annual growths *S. yunnanensis* is best planted in the rear of the shrub border where it can be seen to advantage, losing none of its charm. This species, like others, can be raised readily from seed, but unless it has been grown in complete isolation, where it can safely be assumed to have been self-pollinated, it is better to increase stock by vegetative means. Hard wood cuttings inserted in the open ground during January or February will give a high percentage return, the only sure way of perpetuating a particularly good colour form.

As a hardy flowering shrub, *S. yunnanensis* received an Award of Merit from The Royal Horticultural Society in June 1928 when submitted by Collingwood Ingram.

Other Syringas native to these regions which Forrest collected and of which he sent home seeds, include *S. tomentella*, *S. Potaninii* and *S. pinetorum*. The last mentioned was a new discovery, found in June 1914 in the dry regions north of Tan-tui and on the Li-chiang Range at an elevation of 10,000 ft.; the flowers are of a deep lilac-rose. This is a comparatively rare plant although it is in cultivation at Kew. W. J. Bean, however was doubtful if this was the true form.

Photo, R. Eudall

TROLLIUS YUNNANENSIS

TROLLIUS

Of the five globe-flowers which Forrest collected in China, *Trollius yunnanensis* is the most elegant. It is a near relation of the slighter, but no less beautiful, *T. pumilus* Don of which it was once regarded as a variety. The larger flowers and leafy collar below the corolla readily distinguish it from Don's plant which has a scapiform stem. *T. yunnanensis* was first found by Père Delavay in 1883 and described by Franchet six years later as a variety of *T. pumilus*, but in 1922 Ulbrich accorded it the specific rank of which it seems to be well worthy. *T. patulus* is often confused with *T. yunnanensis* but the area of distribution of the former extends from the Caucasus through Turkestan and Siberia to Kamchatka.

Forrest found specimens matching perfectly Delavay's type of *T. yunnanensis* on the Tali and Li-chiang Ranges in 1910 and in Upper Burma in the Nmai Hka-Salween Divide in 1925. But the species occurs in diverse forms and in 1904 Forrest sent home seeds of *T. yunnanensis f. eupetalus* gathered from the open mountain pasturelands of the Kari Pass in the Yangtze-Mekong Divide. A plant which Messrs. Bees raised from this seed and exhibited at The Royal Horticultural Society in 1913 under the name *T. patulus* "Bees var." gained the Award of Merit. The larger flowers and the nectariferous petals which exceed the stamens in length easily separate *f. eupetalus* from the type plant.

In the Mekong-Yangtze Divide and on the Li-chiang Range during his second, third and fourth journeys, Forrest found taller forms 1½–2½ ft. in height with double flowers. Stapf (*Bot. Mag.* t. 9143) designated these *T. yunnanensis f. uber*.

Differing from *T. yunnanensis* in the narrower petals and more open and boldly divided leaves is *T. stenopetalus*. This may be no more than yet another form of the polymorphic *T. yunnanensis*, a form which Purdom and Father Farges collected on the border of Shensi and Szechwan, and Forrest on the Li-chiang Range and in the Mekong-Salween Divide. Under the name of *T. patulus* Messrs. Veitch were cultivating this form in 1913 and as such it may be still in gardens.

Forms of *T. yunnanensis* have been hybridised successfully with *T. chinensis*, and in 1916 Messrs. Wallace of Colchester received the Award of Merit for one such hybrid under the name of Trollius "King Cup"; the deep golden yellow, green-tipped flowers measured about 2 in. in diameter.

The very distinct and more modest *T. pumilus*, first discovered in Nepal in 1809, is now known to range widely from Nepal to Kansu and Shensi. Naturally with so wide a distribution, this species is also very polymorphic. Forrest showed it to be a common plant in the alpine meadows and beside the streams of many of the mountain ranges in Yunnan and S.E. Tibet. At most a foot tall, and usually much shorter, its dark green glossy leaves and flat flowers, yellow-orange within and purple-crimson without, make it a most desirable plant for the rock garden.

APPENDIX

Forrest Rhododendrons arranged in Series and Subseries

In the Herbarium at the Royal Botanic Garden, Edinburgh, Forrest's Rhododendrons are represented by some 5375 numbered gatherings, with duplicates of many numbers. Those which became the type of a new species, subspecies or variety (although many of the names are now regarded as synonyms) are all cited in the list below. The list also includes species which Forrest first introduced to cultivation. It excludes the many species in his collection which were discovered or introduced earlier by his contemporaries.

Twelve of his plants were awarded a First Class Certificate and forty-eight an Award of Merit; these are indicated in the list.

ANTHOPOGON

Rh. tsarongense Balf. f. & Forrest. Type F. 14334

ARBOREUM/ARBOREUM

Rh. peramoenum Balf. f. & Forrest. Type F. 17708

ARBOREUM/ARGYROPHYLLUM

Rh. Coryanum Tagg & Forrest. Type F. 21693

AURICULATUM

Rh. Griersonianum Balf. f. & Forrest. Type F. 15815. F.C.C. Lowinsky, Rothschild 1924

AZALEA

Rh. microphyton Fr. discovered Delavay 1884, later by Henry and Forrest from whose seed plants were raised

BARBATUM/CRINIGERUM

Rh. Bainbridgeanum Tagg & Forrest. Type F. 21761

Rh. crinigerum Fr. Discovered Soulié 1895. Introduced Forrest 1914. A. M. Rothschild 1935

var. euadenium Tagg & Forrest. Type F. 25619

Rh. ixeuticum Balf. f. & W. W. Sm. Type F. 12944

BARBATUM/GLISCHRUM

Rh. burriflorum Balf. f. & Forrest. Type F. 17598

Rh. diphrocalyx Balf. f. Type F. 15665

Rh. glischroides Tagg & Forrest. Type F. 26426

var. arachnoideum Tagg & Forrest. Type F. 26425

Rh. glischrum Balf. f. & W. W. Sm. Type F. 12901

Rh. habrotrichum Balf. f. & W. W. Sm. Type F. 9048. A. M. White 1933

Rh. rude Tagg & Forrest. Type F. 25645

BOOTHII

Rh. aureum Fr. discovered Delavay, introduced by Forrest 1906

Rh. cerinum Balf. f. & Forrest. Type F. 17592

Rh. chrysodoron Tagg. Cult. F. 25446 (part). A. M. Aberconway 1934

Rh. commodum Balf. f. & Forrest. Type F. 17866. A. M. Stair 1937

Rh. monanthum Balf. f. & W. W. Sm. Type F. 951

Rh. megeratum Balf. f. & Forrest. Type F. 12942. A. M. Swaythling 1935

Rh. sulfureum Fr. discovered Delavay 1886, introduced Forrest 1905

Rh. tephropeplum Balf. f. & Farrer. Discovered Farrer 1920 and introduced Forrest and Kingdon Ward. A. M. Aberconway 1929

Rh. theiochroum Balf. f. & W. W. Sm. Type F. 11910

CAMPYLOGYNUM

Rh. caeruleo-glaucum Balf. f. & Forrest. Type F. 19181

CAMPYLOGYNUM (continued)

Rh. campylogynum Fr. Discovered Delavay 1884, introduced Forrest 1912
Rh. cremastum Balf. f. & Forrest. Type F. 14266
Rh. glauco-aureum Balf. f. & Forrest. Type F. 17544

CEPHALANTHUM

Rh. acraium Balf. f. & W. W. Sm. Type F. 10652
Rh. cephalanthoides Balf. f. & Forrest. Type F. 2182
Rh. clivicola Balf. f. & W. W. Sm. Type F. 10585
Rh. cremnophilum Balf. f. & W. W. Sm. Type F. 12631
Rh. ledoides Balf. f. & W. W. Sm. Type F. 11246. A. M. Bulley 1925
Rh. lepidanthum Balf. f. & W. W. Sm. Type F. 10034
Rh. platyphyllum Balf. f. & W. W. Sm. Type F. 4155
Rh. radinum Balf. f. & W. W. Sm. Type F. 10278
Rh. trichostomum Fr. Discovered Delavay
Rh. sphaeranthum Balf. f. & W. W. Sm. Type F. 12505. A. M. Headfort 1925

EDGEWORTHII

Rh. bullatum Fr. Discovered Delavay 1886 introduced Forrest 1904. A. M. Aberconway 1946, F.C.C. Rothschild 1937

FALCONERI

Rh. arizelum Balf. f. & Forrest. Type F. 15857
Rh. basilicum Balf. f. & W. W. Sm. Type F. 12078
Rh. coriaceum Fr. Discovered Soulié 1898, introduced Forrest
Rh. megaphyllum Balf. f. & Forrest. Type F. 17650
Rh. preptum Balf. f. & Forrest. Type F. 18034

FORTUNEI/FORTUNEI

Rh. araliaeforme Balf. f. & Forrest. Type F. 14151
Rh. adoxum Balf. f. & Forrest. Type F. 15226
Rh. chlorops Cowan. Type cult. F. 16463. A. M. Stair 1938
Rh. decorum Fr. Discovered and introduced Delavay, later by Wilson. Reintroduced by Forrest
Rh. diaprepes Balf. f. & W. W. Sm. Type F. 11958. A. M. Rothschild 1926
Rh. euanthum Balf. f. & W. W. Sm. Type F. 5880
Rh. rasile Balf. f. & W. W. Sm. Type F. 7930
Rh. rhantum Balf. f. & W. W. Sm. Type F. 10075

FULVUM

Rh. dendritrichum Balf. f. & Forrest. Type F. 16366
Rh. fulvoides Balf. f. & Forrest. Type F. 13400
Rh. fulvum Balf. f. & W. W. Sm. Type F. 8989. A. M. McLaren 1933
Rh. niphargum Balf. f. & Ward. Discovered by Ward in June 1913 and by Forrest in July 1913
Rh. uvarifolium Diels. Type F. 5072

GLAUCUM

Rh. brachyanthum Fr. Discovered Delavay 1884. Introduced Forrest 1906
Rh. Genestierianum Forrest. Type F. 17824
Rh. hypolepidotum Balf. f. & Forrest. Discovered Soulié, introduced Forrest and Ward
Rh. micromeres Tagg. Type F. 21811
Rh. shweliense Balf. f. & Forrest. Type F. 18151

GRANDE

Rh. coryphaeum Balf. f. & Forrest. Type F. 16561
Rh. giganteum Forrest MS. (descript.) Tagg. Type F. 19335
Forrest var. seminudum Tagg. Type F. 19338
Rh. praestans Balf. f. & W. W. Sm. Type F. 13023
Rh. protistum Balf. f. & Forrest. Type F. 16351
Rh. semnoides Tagg & Forrest. Type F. 21870
Rh. semnum Balf. f. & Forrest. Type F. 14233

GRANDE (continued)

Rh. sidereum Balf. f. Discovered Lace. Introduced by Forrest, Farrer and Ward
Rh. sinogrande Balf. f. & W. W. Sm. Type F. 9021. F. C. C. Johnstone 1926. A. M. Godman 1922
var. boreale Tagg & Forrest. Type F. 21705

HELIOLEPIS

Rh. brevistylum Fr. Discovered by Soulié and introduced Forrest 1906. A. M. Crossfield 1933
Rh. catapastum Balf. f. & Forrest. Type F. 16597
Rh. desquamatum Balf. f. & Forrest. Type F. 15761. A. M. Fletcher 1938
Rh. fumidum Balf. f. & W. W. Sm. Discovered by Maire. Introduced by Forrest
Rh. heliolepis Fr. Discovered Delavay 1886, introduced Forrest 1912
Rh. pholidotum Balf. f. & W. W. Sm. Type F. 4162
Rh. plebeium Balf. f. & W. W. Sm. Type F. 9060
Rh. porrosquameum Balf. f. & Forrest. Type F. 15071
Rh. rubiginosum Fr. Introduced by Delavay to Paris and thence to England. Forrest reintroduced
Rh. stenoplastum Balf. f. & Forrest. Type F. 17920

IRRORATUM/IRRORATUM

Rh. adroserum Balf. f. & Forrest. Type F. 16353
Rh. admirable Balf. f. & Forrest. Type F. 16378
Rh. agastum Balf. f. & W. W. Sm. Type F. 9920
Rh. anthosphaerum Diels. Type F. 2042
Rh. araiophyllum Balf. f. & W. W. Sm. Type F. 11918
Rh. ceraceum Balf. f. & W. W. Sm. Discovered Monbeig, introduced Forrest
Rh. cerochitum Balf. f. & Forrest. Type F. 15766
Rh. dimitrum Balf. f. & Forrest. Type F. 13736
Rh. eritimum Balf. f. & W. W. Sm. Type F. 12416
Rh. gymnanthum Diels. Type F. 5071
Rh. gymnogynum Balf. f. & Forrest. Type F. 17495
Rh. Hardingii Forrest (descript.) Tagg. Type F. 26313
Rh. hylothreptum Balf. f. & W. W. Sm. Type F. 5848
Rh. irroratum Fr. Discovered Delavay and introduced to Paris by him, reintroduced Forrest
Rh. laxiflorum Balf. f. & Forrest. Type F. 17953
Rh. leptopeplum Balf. f. & Forrest. Type F. 16352
Rh. lukiangense Fr. Discovered by Soulié. Introduced by Forrest
Rh. pennivenium Balf. f. & Forrest. Type F. 15745

IRRORATUM/PARISHII

Rh. eriogynum Balf. f. & W. W. Sm. Type F. 13508. A. M. Lowinsky 1924
Rh. Kyawi Lace & W. W. Sm. Discovered Kyaw, introduced Forrest 1919
Rh. prophantum Balf. f. & Forrest. Type F. 17928. A. M. Rothschild 1927
Rh. schistocalyx Balf. f. & Forrest. Type F. 17637

LACTEUM

Rh. aiolopeplum Balf. f. & Forrest. Type F. 16467
Rh. aberrans Tagg & Forrest. Type F. 23395
Rh. Beesianum Diels. Type F. 2323
Rh. colletum Balf. f. & Forrest. Type F. 14450
Rh. dictyotum Balf. f. MS. (descript.) Tagg. Type F. 16734
Rh. dryophyllum Balf. f. & Forrest. Type F. 14107
Rh. dumosulum Balf. f. & Forrest. Type F. 14088
Rh. emaculatum Balf. f. & Forrest. Type F. 14352
Rh. helvolum Balf. f. & Forrest. Type F. 17784
Rh. intortum Balf. f. & Forrest. Type F. 16303
Rh. lacteum Fr. Discovered Delavay 1884, introduced Forrest 1910 F.C.C. Williams 1926
Rh. levistratum Balf. f. & Forrest. Type F. 14026
Rh. microterum Balf. f. & Forrest. Type F. 16683

LACTEUM (continued)
Rh. nakotiltum Balf. f. & Forrest. Type F. 14060
Rh. sigillatum Balf. f. & Forrest. Type F. 14145
Rh. Traillianum Forrest & W. W. Sm. Type F. 5874
Rh. theiophyllum Balf. & Forrest. Type F. 16836
Rh. vicinum Balf. f. & Forrest. Type F. 14024

LAPPONICUM
Rh. achroanthum Balf. f. & W. W. Sm. Type F. 12581
Rh. cantabile Balf. f. Type F. 16583
Rh. chamaezelum Balf. f. & Forrest. Type F. 14074
Rh. cheilanthum Balf. f. & Forrest. Type F. 11736
Rh. compactum Hutch. Type F. 13905 (cult.)
Rh. complexum Balf. f. & W. W. Sm. Type F. 12520
Rh. cuneatum W. W. Sm. Type F. 6738
Rh. dasypetalum Balf. f. & Forrest. Type F. 13905
Rh. diacritum Balf. f. & W. W. Sm. Type F. 12614
Rh. fastigiatum Fr. Introduced by Forrest in 1906. A. M. Reuthe 1914
Rh. fimbriatum Hutch. Type F. 22197 (cult.)
Rh. glomerulatum Hutch. Type F. 21297 (cult.)
Rh. habanense Balf. f. & Forrest MS. Type F. 15448
Rh. hippophaeoides Balf. f. & W. W. Sm. Discovered Ward in 1913. Introduced Forrest. A. M. Aberconway & McLaren 1927
Rh. idoneum Balf. f. & W. W. Sm. Type F. 12623
Rh. impeditum Balf. f. & W. W. Sm. Type F. 5863. A. M. Sunningdale 1944
Rh. litangense Balf. f. & Forrest. Type F. 16277
Rh. melanostictum MS. F. 17296
Rh. microleucum Hutch. Type F. seed (cult.) F. C. C. Rothschild 1939
Rh. muliense Balf. f. & Forrest. Type F. 16252
Rh. orthocladum Balf. f. & Forrest. Type F. 10481
Rh. osmerum MS. F. 16371
Rh. peramabile Hutch. Type F. 20463 (cult.)
Rh. pycnocladum Balf. f. & W. W. Sm. Type F. 2181
Rh. ravum Balf. f. & W. W. Sm. Type F. 10423
Rh. rupicola W. W. Sm. Type F. 5865
Rh. russatum Balf. f. & Forrest. Type F. 13915. A. M. Williams 1927. F.C.C. Rothschild 1933
Rh. scintillans Balf. f. & W. W. Sm. Type F. 10014. F.C.C. Rothschild 1934. A. M. Aberconway & McLaren 1924
Rh. scleroclad um Balf. f. & Forrest. Type F. 12665
Rh. semanteum Balf. f. & Forrest MS. Type F. 20492
Rh. telmateium Balf. f. & W. W. Sm. Type F. 12478
Rh. yungningense Balf. f. MS. Type F. 20460

LEPIDOTUM
Rh. sinolepidotum Balf. f. & W. W. Sm. Discovered Delavay. Introduced by Forrest in 1906

MADDENII/CILIICALYX
Rh. ciliipes Hutch. Type F. 25484
Rh. lasiopodum Hutch. Type F. 9919
Rh. pachypodum Balf. f. & W. W. Sm. Type F. 11547. F.C.C. Rothschild 1936
Rh. roseatum Hutch. Type F. 11866
Rh. Scottianum Hutch. Type F. 10008
Rh. supranubium Hutch. Type F. 6764
Rh. Valentinianum Forrest. Type F. 16011. A. M. McLaren 1933

MADDENII/MADDENII
Rh. crassum Fr. Discovered Delavay 1885, introduced Forrest 1906. A. M. Lowinsky 1924. A. M. Bolitho 1928

MADDENII/MEGACALYX

Rh. sinonuttallii Balf. f. & Forrest. Type F. 18939
Rh. Taggianum Hutch. Type F. 26440. F.C.C. Adams-Acton 1943, A. M. Headfort 1932

NERIIFLORUM/FORRESTII

Rh. erastum Balf. f. & Forrest. Type F. 14373
Rh. Forrestii Balf. f. MS. (descript.) Diels. Type F. 699
Rh. porphyrophyllum Balf. f. & Forrest. Type F. 16695
Rh. repens Balf. f. & Forrest. Type F. 14011. F. C. C. Stevenson 1935
  var. chamaedoron Tagg & Forrest. Type F. 21768. A. M. Aberconway & McLaren 1932
  var. chamae-Thomsonii Tagg & Forrest. Type F. 21723
Rh. serpens Balf. f. & Forrest. Type F. 16698

NERIIFLORUM/HAEMATODES

Rh. aemulorum Balf. f. Type F. 17853 (First described by Ward as R. mallotum)
Rh. catacosmum Balf. f. MS. (descript.) Tagg. Type F. 21727
Rh. chaetomallum Balf. f. & Forrest. Type F. 16691
  var. glaucescens Tagg & Forrest. Type F. 25607
  var. hemigymnum Tagg & Forrest. Type F. 21728
  var. xanthanthum Tagg & Forrest. Type F. 21725
Rh. chionanthum Tagg & Forrest. Type F. 25592
Rh. haematodes Fr. Discovered Delavay 1885, introduced Forrest 1911. F.C.C. Williams 1926
Rh. hemidartum Balf. f. MS. (descript.) Tagg. Type F. 20028
Rh. pocophorum Balf. f. MS. (descript.) Tagg. Type F. 21713

NERIIFLORUM/NERIIFLORUM

Rh. agetum Balf. f. & Forrest. Type F. 17851
Rh. Albertsenianum Forrest. Type F. 14195
Rh. euchaites Balf. f. & Forrest. Type F. 12125. A. M. Aberconway & McLaren 1929
Rh. floccigerum Fr. Discovered Soulié 1895. Introduced Forrest 1914
  var. appropinquans Tagg & Forrest. Type F. 23297
Rh. sperabile Balf. f. & Farrer var. weihsiense Tagg & Forrest. Type F. 25447
Rh. sperabiloides Tagg & Forrest. Type F. 21824. A. M. Rothschild 1933

NERIIFLORUM/SANGUINEUM

Rh. aperantum Balf. f. & Ward. Discovered Ward, introduced Forrest. A. M. Headfort 1931
  var. subpilosum Cowan Type F. 25596
Rh. apodectum Balf. f. & W. W. Sm. Type F. 18153
Rh. asmenistum Balf. f. & Forrest. Type F. 19169
Rh. asteium Balf. f. & Forrest. Type F. 18937
Rh. brunneifolium Balf. f. & Forrest. Type F. 19025
Rh. citriniflorum Balf. f. & Forrest. Type F. 14271
  sub. sp. aurcolum Cowan Type F. 14503
Rh. chlanidotum Balf. f. & Forrest. Type F. 16714
Rh. cloiophorum Balf. f. & Forrest. Type F. 14269
Rh. dichroanthum Diels. Type F. 4138. A. M. Aberconway & McLaren 1923
Rh. didymum Balf. f. & Forrest. Type F. 20220
Rh. epipastum Balf. f. & Forrest. Type F. 18645
Rh. eudoxum Balf. f. & Forrest. Type F. 14245
Rh. fulvastrum Balf. f. & Forrest. Type F. 19023
Rh. glaphyrum Balf. f. & Forrest. Type F. 18936
Rh. haemaleum Balf. f. & Forrest. Type F. 5073
Rh. himertum Balf. f. & Forrest. Type F. 16728
Rh. horaeum Balf. f. & Forrest. Type F. 20287
Rh. jangtzowense Balf. f. & Forrest. Type F. 18167

NERIIFLORUM/SANGUINEUM (continued)
Rh. leucopetalum Balf. f. & Forrest. Type F. 14270
Rh. liratum Balf. f. & Forrest. Type F. 18153
Rh. mannophorum Balf. f. & Forrest. Type F. 19163
Rh. mesaeum Balf. f. MS. (Cowan). Type F. 19958
Rh. mesopolium Balf. f. & Forrest. Type F. 16751
Rh. nebrites Balf. f. & Forrest. Type F. 19153
Rh. poliopeplum Balf. f. & Forrest. Type F. 19175
Rh. pothinum Balf. f. & Forrest. Type F. 16702
Rh. roseotinctum Balf. f. & Forrest. Type F. 14211
Rh. sanguineum Fr. Discovered by Soulié. Introduced by Forrest 1904
  var. didymoides Tagg & Forrest. Type F. 19982
  sub. sp. atrorubrum Cowan Type F. 18675
  sub. sp. consanguineum Cowan Type F. 25507
  sub. sp. melleum Cowan Type F. 16727
Rh. scyphocalyx Balf. f. & Forrest. Type F. 18050
  var. septentrionale Tagg & Forrest. Type F. 25750
Rh. temenium Balf. f. & Forrest. Type F. 14365
  sub. sp. dealbatum Cowan Type F. 19900
  sub. sp. gilvum Cowan Type F. 21914
Rh. trichomiscum Balf. f. & Forrest. Type F. 16826
Rh. trichophlebium Balf. f. & Forrest. Type F. 18632

OVATUM
Rh. australe Balf. f. & Forrest. Type F. 15673
Rh. leptothrium Balf. f. & Forrest. Type F. 13881

SALUENENSE
Rh. amaurophyllum Balf. f. & Forrest. Type F. 18905
Rh. chameunum Balf. f. & Forrest. Type F. 13904
Rh. cosmetum Balf. f. & Forrest. Type F. 13985
Rh. humicola Balf. f. MS. Type F. 19172
Rh. humifusum Balf. f. MS. Type F. 14336
Rh. keleticum Balf. f. & Forrest. Type F. 18918 A. M. Gill 1928
Rh. pamprotum Balf. f. MS. Type F. 12537
Rh. prostratum W. W. Sm. Type F. 5862
Rh. radicans Balf. f. & Forrest. Type F. 19919. A. M. Stevenson 1926
Rh. saluenense Fr. Discovered by Soulié 1894, introduced Forrest 1914. A. M. Rothschild 1945
Rh. sericocalyx Balf. f. MS. Type F. 16449

SCABRIFOLIUM
Rh. hemitrichotum Balf. f. & Forrest. Type F. 16250
Rh. mollicomum Balf. f. & W. W. Sm. Type F. 11490. A. M. Aberconway & McLaren 1931
Rh. pubescens Balf. f. & Forrest. Type F. 16812
Rh. scabrifolium Fr. Discovered Delavay 1883 and introduced to Paris 1885. Reintroduced Forrest 1913
Rh. spiciferum Fr. Discovered Delavay. Introduced Forrest in 1905

STAMINEUM
Rh. Mackenzieanum Forrest. Type F. 16111
Rh. nematocalyx Balf. f. & W. W. Sm. Type F. 7673
Rh. oxyphyllum Fr. Discovered by Prince Henri d'Orleans 1885. Introduced Forrest
Rh. pectinatum Hutch. Type F. 26022 in cult.
Rh. stenaulum Balf. f. & W. W. Sm. Type F. 5530. A. M. Stair & Rothschild 1937

TALIENSE/ADENOGYNUM
Rh. adenogynum Diels. Type F. 2395

TALIENSE/ADENOGYNUM (continued)
Rh. adenophorum Balf. f. & W. W. Sm. Type F. 10429
Rh. alutaceum Balf. f. & W. W. Sm. Type F. 13098
Rh. Balfourianum Diels. Type F. 4166
var. aganniphoides Tagg & Forrest. Type F. 20456
Rh. Bureavii Fr. Discovered Delavay, introduced Forrest 1908. A. M. Rothschild 1939
Rh. codonanthum Balf. f. & Forrest. Type F. 19810
Rh. detonsum Balf. f. & Forrest. Type F. 13789
Rh. dumicola Tagg & Forrest. Type F. 25580
Rh. elegantulum Tagg & Forrest. Type F. 21292
Rh. mimetes Tagg & Forrest. Type F. 21417
var. simulans Tagg & Forrest. Type F. 20428

TALIENSE/ROXIEANUM
Rh. aischropeplum Balf. f. & Forrest. Type F. 14061
Rh. bathyphyllum Balf. f. & Forrest. Type F. 14718
Rh. coccinopeplum Balf. f. & Forrest. Type F. 16379
Rh. comisteum Balf. f. & Forrest. Type F. 14501
Rh. globigerum Balf. f. & Forrest. Type F. 16376
Rh. gymnocarpum Balf. f. MS. Tagg. Type F. 16687. A. M. Rothschild 1940
Rh. porphyroblastum Balf. f. & Forrest. Type F. 16469
Rh. iodes Balf. f. & Forrest. Type F. 16745
Rh. lampropeplum Balf. f. & Forrest. Type F. 16509
Rh. microgynum Balf. f. & Forrest. Type F. 14242
Rh. perulatum Balf. f. & Forrest. Type F. 14421
Rh. poecilodermum Balf. f. & Forrest. Type F. 14432
Rh. pronum Tagg & Forrest. Type F. 23375
Rh. proteoides Balf. f. & W. W. Sm. Type F. 13470
Rh. recurvum Balf. f. & Forrest. Type F. 10540
var. oreonastes. Balf. f. & Forrest. Type F. 13005
Rh. Roxieanum Forrest. Type F. 12609
Rh. russotinctum Balf. f. & Forrest. Type F. 13971a
Rh. triplonaevium Balf. & Forrest. Type F. 13570
Rh. tritifolium Balf. f. & Forrest. Type F. 14140

TALIENSE/TALIENSE
Rh. aganniphum Balf. f. & Ward var. adenophyllum MS. Type F. 14332
Rh. agglutinatum Balf. f. & Forrest. Type F. 16319
Rh. Clementinae Forrest. Type F. 10857
Rh. dichropeplum Balf. f. & Forrest. Type F. 10612
Rh. fissotectum Balf. f. & Forrest. Type F. 14049
Rh. flavorufum Balf. f. & Forrest. Type F. 14341
Rh. glaucopeplum Balf. f. & Forrest. Type F. 14133
Rh. lophophorum Balf. f. & Forrest. Type F. 13971
Rh. phaeochrysum Balf. f. & W. W. Sm. Type F. 10547
Rh. schizopeplum Balf. f. & Forrest. Type F. 14094
Rh. sphaeroblastum Balf. f. & Forrest. Type F. 17360
Rh. syncollum Balf. f. & Forrest. Type F. 14035

THOMSONII/CAMPYLOCARPUM
Rh. callimorphum Balf. f. & W. W. Sm. Type F. 12019
Rh. cyclium Balf. f. & Forrest. Type F. 18044
Rh. hedythamnum Balf. f. & Forrest. Type F. 11601
Rh. myiagrum Balf. f. & Forrest. Type F. 17993
Rh. telopeum Balf. f. & Forrest. Type F. 18963

THOMSONII/MARTINIANUM
Rh. eurysiphon Tagg & Forrest. Type F. 21694
Rh. Martinianum Balf. f. & Forrest. Type F. 13439

THOMSONII/SELENSE

Rh. axium Balf. f. & Forrest. Type F. 16684
Rh. beimaense Balf. f. & Forrest. Type F. 13951
Rh. blandulum Balf. f. & W. W. Sm. Type F. 11577
Rh. calvescens Balf. f. & Forrest. Type F. 14331
Rh. chalarocladum Balf. f. & Forrest. Type F. 18646
Rh. cymbomorphum Balf. f. & Forrest. Type F. 13930
Rh. dasycladum Balf. f. & W. W. Sm. Type F. 10430
Rh. docimum Balf. f. MS. Type F. 13951
Rh. dolerum Balf. f. & Forrest. Type F. 16318
Rh. duseimatum Balf. f. & Forrest. Type F. 14464
Rh. erythrocalyx Balf. f. & Forrest. Type F. 13989
Rh. esetulosum Balf. f. & Forrest. Type F. 16581
Rh. eucallum Balf. f. & Forrest. Type F. 13938
Rh. jucundum Balf. f. & W. W. Sm. Type F. 4150
Rh. manopeplum Balf. f. & Forrest. Type F. 18654
Rh. metrium Balf. f. & Forrest. Type F. 16679
Rh. nanothamnum Balf. f. & Forrest. Type F. 19019
Rh. panteumorphum Balf. f. & W. W. Sm. Type F. 5068
Rh. probum Balf. f. & Forrest. Type F. 14227
Rh. rhaibocarpum Balf. f. & W. W. Sm. Type F. 12982
Rh. selense Fr. Discovered Soulié introduced Forrest 1917
Rh. setiferum Balf. f. & Forrest. Type F. 14066
Rh. truncatulum Balf. f. & Forrest. Type F. 13936
Rh. vestitum Tagg & Forrest. Type F. 21877

THOMSONII/SOULIEI

Rh. astrocalyx Balf. f. & Forrest. Type F. 14128. A. M. Williams 1926
Rh. croceum Balf. f. & W. W. Sm. Type F. 11466. A. M. Williams 1926
Rh. gloeoblastum Balf. f. & Forrest. Type F. 18672
Rh. litiense Balf. f. & Forrest. Type F. 13922. A. M. Rothschild 1931
Rh. oresterum Balf. f. & Forrest. Type F. 16715
Rh. prasinocalyx Balf. f. & Forrest. Type F. 16511
Rh. puralbum Balf. f. & W. W. Sm. Type F. 10616

THOMSONII/THOMSONII

Rh. cyanocarpum (Fr.) W. W. Sm. Discovered Delavay. Introduced Forrest 1906. A. M. Loder 1933
  var. eriphyllum. Balf. f. MS. Type F. 11593
Rh. eclecteum Balf. f. & Forrest. Type F. 14804. A. M. Rothschild 1949
  var. anisocalyx MS. Type F. 19548
  var. bellatulum MS. Type F. 19535
  var. benemaculatum MS. Type F. 21838
  var. brachyandrum Balf. f. & Forrest. Type F. 18943
Rh. Meddianum Forrest. Type F. 15767
  var. atrokermesinum Forrest. Type F. 26499
Rh. Stewartianum Diels. Type F. 5069. A. M. Rothschild 1934

TRICHOCLADUM

Rh. chloranthum Balf. f. & Forrest. Type F. 13900
Rh. lepidostylum Balf. f. & Forrest. Type F. 18143
Rh. lophotogynum Balf. f. & Forrest MS. Type F. 17941
Rh. mekongense Fr. Discovered by Soulié, introduced by Forrest
Rh. oulotrichum Balf. f. & Forrest. Type F. 8905
Rh. rubrolineatum Balf. f. & Forrest. Type F. no number & F. 13914
Rh. semilunatum Balf. f. & Forrest. Type F. 698
Rh. trichocladum Fr. Discovered Delavay 1884. Introduced Forrest 1910
Rh. xanthinum Balf. f. & W. W. Sm. Type F. 12066

TRIFLORUM/AUGUSTINII

Rh. chasmanthoides Balf. f. & Forrest. Type F. 689

TRIFLORUM/AUGUSTINII (continued)

Rh. chasmanthum Diels. Discovered Soulié 1893. Introduced Forrest 1919. A. M. Rothschild 1930. F. C. C. Rothschild 1932

TRIFLORUM/OREOTREPHES

Rh. artosquameum Balf. f. & Forrest. Type F. 14535
Rh. cardioides Balf. f. & Forrest. Type F. 13931
Rh. depile Balf. f. & Forrest. Type F. 13992
Rh. exquisitum Hutch. Type F. 20489. A. M. Rothschild 1937
Rh. hypotrichotum Balf. f. & Forrest. Type F. 16543
Rh. oreotrephes W. W. Sm. Type F. 5873
Rh. oreotrephoides Balf. f. MS. Type F. 10297
Rh. phaeochlorum Balf. f. & Forrest. Type F. 19200
Rh. pubigerum Balf. f. & Forrest. Type F. 19206
Rh. sycnanthum Balf. f. & Forrest. Type F. 6771
Rh. timeteum Balf. f. & Forrest. Type F. 16285. A. M. Rothschild 1932
Rh. trichopodum Balf. f. & Forrest. Type F. 14347

TRIFLORUM/TRIFLORUM

Rh. caesium Hutch. Type F. 26798

TRIFLORUM/YUNNANENSE

Rh. aechmophyllum Balf. & Forrest. Type F. 16790
Rh. erileucum Balf. f. & Forrest. Type F. 17593
Rh. hesperium Balf. f. & Forrest. Type F. 15576
Rh. hormophorum Balf. f. & Forrest. Type F. 16265. A. M. Digby 1943
Rh. hypophaeum Balf. f. & Forrest. Type F. 16249
Rh. leilungense Balf. f. & Forrest. Type F. 15208
Rh. obscurum (Fr.) Balf. f. Type Delavay. Forrest collected
Rh. pleistanthum Balf. f. MS. Type F. 16357
Rh. stereophyllum Balf. f. & W. W. Sm. Type F. 11299
Rh. suberosum Balf. f. & Forrest. Type F. 18000
Rh. zaleucum Balf. f. & W. W. Sm. Type F. 8923. A. M. Stephenson Clarke 1932

VACCINIOIDES

Rh. sinovaccinioides Balf. f. & Forrest. Type F. 29973

VIRGATUM

Rh. oleifolium Fr. Discovered Delavay 1884, introduced Forrest 1906

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MAP SHOWING AREA COVERED BY GEORGE FORREST IN HIS JOURNEYS