A MONOGRAPH
OF THE
GENUS
LILIUM

by
HENRY JOHN ELWES, F.L.S., F.Z.S.

ILLUSTRATED BY
W.H. FITCH, F.L.S.

No. 11, Camden
1880.
TO

MY WIFE

WHO FIRST LED ME TO THE CULTURE OF PLANTS.

AND WHOSE

LOVE FOR LILIES SUGGESTED TO ME THEIR STUDY.

I DEDICATE THIS BOOK.

In Memory of

THE HAPPY DAYS I HAVE SPENT IN ITS PREPARATION.
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Some in the North-west Himalayas at about 8000 feet elevation, where *Lilium polyphyllum* is found. (Photographed by BOCHE and SHEPPARD, Calcutta.)

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LѴIII. x., last line, for 1876 read 1877.
INTRODUCTION.

Before attempting to give a general sketch of the true Lilies, I must inform my readers that the book is not the work of a scientific botanist, but is merely the result of a few years' horticultural study, during which I have endeavored to bring together all the information which seemed likely to elucidate as far as possible some of the difficult questions which are met with in the study of these plants.

To enable a person to understand, even imperfectly, the abstruse subjects which must be mastered before he can have, in modern times, any claim to the title of a botanist, a long course of study must be undertaken; and as I have never had the opportunity of acquiring a scientific education, I do not suppose that I have any right to call this a monograph, by which I understand an exhaustive account of every fact which bears on the development, classification, and history of the objects in question. It seems to me, however, that no botanist, however great may be his acquirements, is able to understand thoroughly the relations and affinities of orders, and particularly of such orders as Liliaceae, Amaryllidaceae, Orchidaceae, and other Monocotyledons, unless he has the opportunity of studying the living plants. To do this he must be either himself a horticulturist, or must have the assistance of a gardener whose mind is not exclusively devoted to the ornamental or the economic branch of his art.

I think it is not yet fully recognized how intimately the two sciences of botany and horticulture are connected. No horticulturist can attain the higher ranks of his profession without a more or less accurate knowledge of botany; and no botanist can be said to be more than half master of his subject whose studies have been confined to the library and the herbarium.

For this reason we find that such men as Herbert, Lindley, Wallich, Sir William and Sir Joseph Hooker, Reichенrach, Thuret, and Akas Gray have attained a prominent distinction as scientific botanists, and from the same cause it will be found, as time goes on, that a large and well-supported garden is as much an absolute necessity to the working botanist as a library and an herbarium.

No one who has attempted to compare botanical descriptions of Monocotyledonous plants with the living realities can have failed to meet with extreme difficulty in identifying them, or to realize the fact that an accurate drawing is more useful than such a description as can be usually made from dried specimens.

The variation of plants is a subject that would require much space even to touch upon; but I may say that I fully concur in the idea which was so strongly supported by that excellent observer Dean Herbert, in
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the admirable paper at the end of his work on the Amaryllidaceae, on "Crosso and Hybrid Intermixtures in Vegetables"—that the true way to test the validity of a so-called species is by propagating it from seed, when the tendency to vary possessed by the species will be made manifest, and the varieties produced will show the observer how far he may rely upon certain characters in separating the species from others. In the same way I think that the surest way to test the validity of a genus is to attempt to hybridise the members of it with other plants, when, if we find that they will cross readily with another belonging to an apparently different genus, it affords a strong presumption of the identity of those genera.

This subject, however, is surrounded with such a multitude of difficulties that it requires the judgment and power of observation of a Darwin to investigate it with fitting accuracy. Let it suffice to say that I know of no case in which a Lily has been crossed with a plant belonging to any other genus, and that the numerous attempts at hybridising the true Lilies into other have met with very little success.

If any of the conclusions I have arrived at, as to the classification of the genus Lillae, are not in accordance with the views that have been expressed by others, I can only say that I have in all cases endeavoured to consider facts only, and have no preconceived theory, or desire to favour the theories of others.

It may be that, as horticulturists increase in number, and our knowledge of plants in a state of nature extends, many new facts bearing on the question will be discovered; and I can easily believe that some of the plants which now seem to deserve specific distinction may be reduced to the rank of varieties, whilst other forms may be proved worthy of specific rank. In this case I can only say that I shall welcome any well-founded corrections that may be introduced into the genus, as no one can be more sensible than myself of the imperfections of my work, and no one can feel more strongly than I do that scientific truth is the first object which every worker in the great field of nature should hold up as the aim of his studies.

With regard to our present knowledge of the genus Lillae, I can say that I do not think many new species remain to be discovered; for though I have used every means to procure plants, living or dead, from every part of the world where Lillae are known, or are likely to occur, not more than three or four species have been added to the genus in the last four years.

The only regions from which much novelty can be expected are the Eastern Himalayas and the immense tract of unexplored and difficult mountain country which surrounds our Indian empire on the north and east, and which lies round the head-waters of the Irrawaddy, the Bhamaputra, and the Yang-tse-kiang. Many years must elapse, however, before these (to the naturalist and ethnologist) most interesting mountains can be even partially explored, as the extreme difficulty of the country, and the excessive isolation and barbarism of the tribes which inhabit it, make this region more difficult of access than perhaps any other part of the world.

The Corom peninsula may also produce some new species of Lily; but though the flora of that country is absolutely unknown to us, it may be expected that any indigenous plants of great beauty or horticultural value have already found their way into the gardens of Japan.

Having found by experience that drawings of plants made from dried specimens frequently fail to give a good idea of their aspect and character, I have made it my object to procure living plants of every species which it was possible to obtain, and have had under cultivation in my own garden every known species of Lily excepting about four. Whenever I have been obliged to resort to dried specimens, or to drawings, as material for my illustrations, I have mentioned the fact in the accompanying description. It has been objected by some botanists that plates drawn from highly cultivated garden specimens do not give a good idea of the plants in a state of nature; and there are, no doubt, cases in which this is more or less the fact.

Experience, however, teaches that the state of perfection to which any Lily may be brought in cultivation, is not greater than the plant is capable of attaining under thoroughly favourable conditions in a wild state; and in proof of this I may say that the plates of L. albiflora, L. washingtonianum, L. monadelphum, and others,
which are taken from the finest specimens I could procure, and which are no doubt much finer than is usual in cultivation, fall short, both in the number and in the size of their flowers, of the descriptions I have received of their growth, under favourable circumstances, in their native countries, as well as of dried specimens which I have examined.

The extreme tendency to variation in nearly all the Lilies makes it impossible to give illustrations which represent faithfully all their forms; but it has been my constant endeavour, as well as that of Mr. Hitch, to combine truthful delineation with artistic excellence. The colouring of the plates has, in some few cases, fallen short of what I could have wished; but though I have spared neither pains or expense to get this done as accurately as possible, there are some tints, such as the shining coral-red of *L. chalcedonicus*, which cannot be exactly reproduced except in all-colours.

The materials which I have used in working out the synonymy, distribution, and variation of the plants have been as follows—the dried specimens in the public herbaria of Kew, Paris, Leyden, and Berlin; the type specimens of Humbert’s herbarium at Upsala; the living plants in my own garden, in the Botanic Gardens of Kew and Edinburgh, and in the collections of my friends Messrs. G. F. Wilson, George Maw, Max Leichtlin, Rev. H. Elwes, and many others, to all of whom I must again express my most hearty thanks for the free use which they have allowed me to make of their specimens and drawings, and for the kindness with which they have assisted me in getting all possible information. From Messrs. Bare, White, Bull, Kewlock, de Graaff, Van Houtte, War, Walkley, and other professional horticulturists I have also received invaluable assistance and information; and I must say that the enterprise shown by these and others, in the introduction and propagation of plants (many of which do not prove profitable from a business point of view), has been, and I hope will always be, of the very greatest service and advantage to the botanist and scientific horticulturist.

Among my correspondents abroad, I must thank especially Dr. Regel and Prof. Maximowicz of St. Petersburg, Herr Max Leichtlin of Baden, Prof. Duchartre and the Abbé David of Paris, Dr. King of Calcutta, Prof. Sergeant and Watson of Harvard University, and Messrs. Pringle and Hanson, Otto Grosemans, and others in the United States, for the immense assistance they have given me in procuring information and plants, all of which I have acknowledged in the body of the work, and without which it would have been impossible to complete it.

And, finally, most important in the assistance I have received from Mr. J. G. Baker, of the Royal Herbarium of Kew, upon whose Revision of the Lilies in the ‘Journal of the Linnean Society’ all my work is based, whose scientific descriptions I have used in almost all cases, and without whose experience and help, so freely afforded to myself and others, I fear I should have failed to keep my work free from many errors and omissions.

**LITERARY HISTORY OF THE GENUS.**

The Lilies, being conspicuous and beautiful plants, have attracted the attention of authors from so early a date that it would be impossible to enumerate all the pre-Linnean writers who have mentioned them; those who are curious as to their ancient and medieval history will do well to consult M. de Canning’s ‘Monographie Historique et Littéraire des Lys’ (Molins, 1870), where many quotations are given in poetry and prose, and where many strange facts and fancies concerning Lilies are quoted from numerous authors. For our present purpose, however, it will only be necessary to mention a very few of these, among whom Parkinson takes a leading place. This charming old writer, whose ‘Paradisus, or Garden of Pleasant Flowers’ was
published in 1689, puts the Lilies at the commencement of his work, "because the Lily is the more stately flower among many," and after describing the Crown Imperial, which, "for his stately beautfulness, deserweth the first place in this our garden of delight," proceeds to enumerate the species known to him, which are described with wonderful accuracy in the quaintest of Elizabethan English. Parkinson mentions five varieties of the "Martagon Imperial" (L. martagon);—"the spotted Martagon of Canada" (L. canadense), which had already been introduced to Europe at this early period; "the early red Martagon or Martagon Pannonia" (L. purpureum); "the red Martagon of Constantinople" (L. chalcedonicum), "the bright red Martagon of Hungary" (L. carnosum); and "the yellow spotted Martagon" (L. pyramidalis). He gives rough though characteristic woodcuts of these plants, and mentions the "place" or habitat, the "time" or season of flowering, and the "name" or synonyms of each. Of the umbellate Lilies he mentions six varieties, distinguishing clearly between L. creeruleum (the "gold red Lily") and L. athitherum ("the red-ballised Lily"). He then describes two varieties of the white Lily, which complete the list of those known to him.

Kerner in the 'Arabesques Academic,' published in 1714, enumerates several species of Lilies, among which, though they were ignored or overlooked by Linnæus, L. cedifolium, L. speciosum, and L. birnum can probably be recognized.

Linnæus, in the 3rd edition of his 'Systema Plantarum' (1753), describes nine species, viz. L. candidum, L. bulbiferum, L. purpureum, L. chalcedonicum, L. superbum, L. Martagon, L. canadense, L. philadephicum, and L. lanceolatum. He treats as varieties several plants which are now ranked as species, and includes one, L. lanceolatum, which are now refer to the genus Friddella.

Thunberg, who spent many years in Japan, published, in 1781, his 'Flora Japonica,' in which the following species are described:—L. candidum et L. longifolium; L. japonicum; L. purpureum; probably =L. colchicum; L. bulbiferum, =L. elegans; L. superbum, =L. speciosum; L. canadense, =L. Hannuri; L. philadephicum, =L. elegans. He seems to have determined to make all the species he found in Japan agree with those described by Linnæus; and, in consequence, we are unable to identify with certainty several of them; but, in the second volume of the 'Transactions of the Linnean Society,' he gives further details of some of his species, and describes L. speciosum, L. longifolium, and L. cedifolium. Still later he published, in the 'Memoirs of the Imperial Academy of Sciences of St. Petersburg, 1811,' an "Examen Liliumorum Japanicorum," in which seven species are described, and three badly figured, viz. L. lanceolatum, L. longifolium, and L. lanceolatum. Most of Thunberg's descriptions are so vague, or taken from such imperfect or abnormal specimens, that they cannot be relied on with certainty; and it was only by examining the specimens in his herbarium that I was able to make out that L. lanceolatum and L. lanceolatum are not good species, and that L. elegans is what has been hitherto known as L. Thunbergiæum.

Though Walter, Michaux, Gawler, Don, Fischer, and others added one or more species each to the genus, no great increase to our knowledge was obtained till von Steudel went to Japan and sent home numerous specimens of Lilies, both living and dried, about 1850. All those which he found were enumerated in Steudel and Zuccarini's 'Flora Japonica,' where L. cedifolium is first described, and a fair account given of the other species known to him.

Roocher and Schultes's 'Systema Vegetabilium' (1829) and Kuntze's 'Enumeratio' (1843), being merely descriptive catalogues of plants, need not be referred to, except to say that L. Wallachianum was first described by Schultes.

The first attempt at a monograph of the genus is the "Mémoire sur les espèces du genre Lili," by D. Scabr, published in 1847, in the nineteenth volume of the 'Mémoires de l'Académie Royale de Belgique.'

This memoir enumerates all the species known at that time, and gives careful descriptions, with synonyms, history, and detailed instructions for the cultivation of the various species. It was by far the most
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complete and useful account of the genus until quite recently, as it includes all Siebold's discoveries, and, being the work of a skilled horticulturist and fair botanist, was based on careful observations of living plants, which, as I have before said, are indispensable for the study of Lilies.

In 1870, Professor Duchartre, of Paris, was attracted by the unequalled collection of living Lilies formed by Henry Max Leichtlin, of Carlsruhe; and, wishing to make them better known to the horticultural and scientific world, he published, in the second series of the Journal of the 'Société Centrale d'Horticulture' of France, his "Observations sur le Genre Lili," an elaborate and most careful paper, of 142 pages, in which the history and classification of the genus is elaborated with much detail, and careful descriptions in French are given of all the species then known.

About the same time Mr. J. G. Baker, of Kew, published, in a series of articles in the 'Gardener's Chronicle' for 1871, a synopsis of the genus, which has had an enormous influence in making it better known and appreciated by horticulturists, and was the principal guide I had in taking up its study.

The direct result of the labours of Messrs. Leichtlin, Duchartre, and Baker has been so great that I do not think there is any genus of plants, having so extensive a range of distribution, which has been studied with as much completeness, or about which so little remains to be discovered, as the Lilies; and, though there is much to be done before the minutiae of their development and variation can be said to be fully known, yet I do not think the publication of a Monograph on them is so premature as it would be in the case of most other wide-ranging genera of plants.

Prof. Sereno Watson has recently published, in the fourteenth volume of the 'Proceedings of the American Academy of Arts and Sciences,' July 1879, a Revision of the North-American Liliaceae, which gives a complete description of the Lilies of that country, and which, I am glad to see, agrees very nearly with my conclusions as to the species and varieties.

Besides the writers already mentioned, the late Prof. Karl Koch has published, in the 'Wochenschrift für Gärtner und Pflanzenkunde' for July and August 1870, a memoir of the genus, in which he gives a key to their classification, together with critical notes on their synonymy and distribution.

Mr. J. H. Kellogg, of Haarlem, whose nurseries probably contain a larger number of Lilies than any others in the world, has published a 'Notice sur quelques espèces et variétés de Lili,' in which several species are described and figured—among them L. Wittii, L. Humiditii, and L. triplum flos pleno.

In America, Dr. Kellogg has described several of the western species in the 'Proceedings of the California Academy of Natural Science;' and many notes on hybridization and cultivation have appeared in various periodicals.

The horticultural journals of the last few years, especially the 'Gardener's Chronicle' and the 'Garden,' also contain an immense number of valuable notes concerning Lilies.

As a strictly scientific account of the genus, Mr. Baker's Revision of the Tulipes, in the 'Journal of the Linncean Society' for 1874, is preeminent. His remarks on the affinities, relations, and morphology of the genus cannot be neglected by any one wishing to understand them thoroughly.

Prof. Duchartre, of Paris, has published, in the 'Bibliothèque de l'École des Hautes Études,' vol. viii. 1873, and vol. xiv. 1875, two most remarkable memoirs on the bulbs of Lilies, in which the various stages of their development from the seed are most carefully described and figured with extreme care and minuteness. An excellent series of drawings of the bulbs of Lilies in their adult state has been made by Mr. Burbridge, and was published in 'The Garden' in 1876.
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CLASSIFICATION.

In Mr. Baker’s revision of the Liliaceae, which is the latest as well as by far the most complete and systematic arrangement of the order, the Lilies are included with the Tulips, Fritillaries, Caleochériti, Erythroniæ, and Lycumæi in the tribe Tulipææ, and form a very homogeneous genus, few of the plants included in it being aberrant from the general type. It has been subdivided into five subgenera, of which four are natural and well-marked; but there are a few plants which do not seem to me to fall conveniently into either of these subdivisions.

The characters by which we can best classify the Lilies are taken from the bulb, and from the form and position of the flowers. The first subgenus, Cardininæum of Endlicher, is a very distinct and well-marked one, and comprises only two nearly allied though perfectly distinct species, L. piperinæum and L. eudiffusum. The bulb in these is formed of a few thick closely compressed scales, produced into long petioles, which bear a large corolla or ovate shining green leaf. Until the bulb becomes strong enough to flower, which is at about its sixth or seventh year, there is no stem or other leaf save these basal ones; but the flowering stem, when produced, absorbs the whole life and substance of the bulb; and the plant perishes completely after flowering and maturing seed, which is produced very abundantly. In some cases, however, offsets are formed at the base of the old bulb, which in time grow to a flowering size. Now this manner of reproduction, namely by seeds, appears to me the natural and regular course in this subgenus; for though in cultivation the reproduction by offsets is the more common, yet in its native forests L. piperinæum appeared to me to grow as though all the plants were seedlings, and I found no groups of offsets about the base of the old stems, as one does in garden plants. I should not, therefore, consider that either of these species is a true perennial, and am inclined to think that many other Lilies usually considered perennial are not so, strictly speaking; for I have found that many of them, after being brought to the highest state of perfection, and having produced seeds freely, die away unaccountably, as though they had fulfilled their function, and had by the act of seedling exhausted all the vitality of the bulbs.

The next subgenus, Endlicheri of Endlicher, is characterized by long tubular flowers, the segments of which are hardly reflexed, except at their tips. It includes, according to Mr. Baker’s arrangement, the following species—L. philippinæum, Wallachianæum, sulphurinæum, nipponiacum, longiflorum, Browni, japonicum, candidum, belladonæum, and Washingtoniæum. Now, as to the first six of these plants, there can be no question about the propriety of this arrangement, as they seem to me to be very possibly only subspecies, and comprise all the representatives of the family found in the eastern tropics or Oriental region—the sixth, L. Browni, being an outlying representative in Japan. But I think that L. japonicum has more affinity with L. auratum, placed by Mr. Baker in another group; L. belladonæum is probably a synonym of it; L. candidum (our common white Lily) seems to me to have sufficient peculiarity in structure and habit to justify its separation from the Endlicheri group; and L. Washingtoniæum I should be inclined to place with two near allies or subspecies, in another section.

In the subgenus Endlicheri thus restricted we find a very different bulb-structure, consisting of a large number of thinner pointed scales, which bear narrow linear leaves only, in their earliest stages of growth, and throw up stems at the age of two or three years, flowering freely and ripening seed. Usually, however, they produce as well a number of small bulblets, which are formed either at the base of the old scales, at the base of the stem, or all along its subterraneous portion, and frequently at various points on the stem above ground, especially when any injury has checked or arrested the formation of flowers.

The plants included in the genus Endlicheri seem, therefore, to be true perennials; that is to say, they possess the power of reproducing themselves for an indefinite period without seedling. They are the only Lilies which are found within the tropics, and appear to require, and to thrive under, a greater degree of heat than other Lilies, though they are all inhabitants of hilly or elevated regions. I believe that the season of growth in these plants is regulated, in their native countries, not by the summer and winter, but by the rainy and dry seasons.
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L. Wallichianus and L. sulphureus, at any rate, do not commence growth till the rains begin in June, and ripen their seed in mid-winter, when all the Lilies of temperate climes have gone to rest.

With regard to L. candidum, we find certain characters of habit which seem to keep it apart from other Lilies. First, it has, like L. giganteum, leaves of two different classes—first, the basal leaves, which are borne on the new scales in the centre of the bulb, and appear early in autumn, coinciding with the period of autumnal rains in the countries to which it is supposed to be indigenous; and, secondly, the stem-leaves, which are borne on the flowering stem, and do not appear till the basal leaves are withering. The flowers of this Lily are not quite similar in form to those of the E. viridis or any other group; so that the plant seems to have some claim to subgeneric distinction.

L. Washingtonianus, with its variety or subspecies L. porporaora, and a newly-discovered plant, L. Proreg, though resembling the E. viridis group to a certain extent in their flowers, are so different in the structure of their bulbs, that they must also stand in a group apart from any other.

The next section in Asclepias of Baker, in which he includes L. tigrina, speciosa, auratum, and auratum, This does not appear to me a very natural group. L. tigrina seems to have more in common with the Martagonum, whilst L. auratum is an aberrant form, differing entirely in bulb and habit, and having nothing but the position of the flowers to bring it near auratum. If this section is to stand, I think it should include L. japonica, which is certainly nearer to auratum than to the E. viridis Lilies.

The next subgenus is Indiria of Baker, including all the plants with erect flowers and falcate segments not reflexed. Four of the species comprising it, viz. bulbifera, aconitiflora, elata, and auricauca, are so nearly allied that they have been considered, with much reason, as only subspecies, and run so closely into each other that it is impossible to distinguish some of the garden varieties and hybrids which they have produced. These plants, again, may be called perennial—propagating themselves constantly by means of offsets as well as by seeds, which are very sparingly produced either in cultivation or, as it seems, in nature.

The other four plants included in the section by Mr. Baker, namely L. canadensis, L. philadelphicus, L. Catharina, and L. metalloides, are, as regards their flowers, fairly uniform with the bulbifera group, but in their bulbs and habit very dissimilar, having individual peculiarities of considerable importance, which are alluded to in detail in the text of this work, and which are probably modifications of structure, intimately connected with the natural conditions under which they grow. L. Catharina is a small, delicate species, confined to a very narrow range as regards its distribution, and probably not fitted to survive in the struggle for existence with other plants.

In the case of L. metalloides, if the very limited materials on which our knowledge of the plant is based do not mislead us, we have a species resembling the others with which it is grouped in nothing but the position of the flowers, but so nearly allied to L. canadensis in every other respect, that I cannot help suspecting an aberrant condition of the specimen on which it was founded. If not, I can only say that, however systematic the subgenus may be which includes it, it is not natural; and the case would tend to show that the position of the flowers is not in all cases a character on which much reliance can be placed.

The last and most numerously section of Lilies is called Martagon by Endellien, and includes all those with cernuous flowers and much-recurred segments. It may be again subdivided into the American group, with rhizomatous or irregular bulbs, like L. canadensis and L. Hamboldtii, and into the Old-World group, with solid regular bulbs, like Howmania, metalloides, and catharina. But here, again, we have several plants possessing characters which will not allow them to fall into what would be otherwise a very convenient arrangement—L. Leichtlini being much more akin to L. tigrina than to the true Martagons, and L. tenuifolium not only having a quite peculiar bulb-structure, but being, as regards its duration, little more than a triennial, whilst others, such as metalloides and pyrrhceum, take eight or ten years to develop from seed into flowering plants.

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INTRODUCTION.

To recapitulate briefly, I find that the subgenera which have been proposed in this genus are not, except in the case of Carderiurn, really natural; or if they are natural as regards certain species, they are not so for others; I should therefore prefer to drop them entirely. The genus is not so large or so diverse as to require the maintenance of artificial groups such as these seem to be; and though I will indicate the affinities of the different species, together with the principal characters by which they may be recognized, I will not pretend to support an arrangement which cannot, as I think, be dissected by a careful observer without revealing imperfections and errors.

GEOGRAPHICAL DISTRIBUTION.

The Lilies have a somewhat peculiar geographical distribution, being found nearly all over the temperate zone of the Old and New Worlds, but, with the exception of three or four species (all of which belong to the Euloria section), nowhere within the tropics. As far as our present knowledge extends, they are absent from the immense tract of country between the Caspian Sea and Western China, though the mountain-ranges of Turkestan may be found to contain some as yet unknown species.

The climatic conditions which seem to favour their growth are a moderately cold winter of short duration, and a warm spring and summer with considerable moisture. Thus we find them absent from these parts of Europe and Asia which are subject to perennial or periodical seasons of severe drought. The two centres in which their headquarters seem to be are Japan, with about twelve indigenous species, and California, with eight or nine. The Himalayas Mountains, where the climatic and other conditions seem very favourable are not so prolific as might be expected, only five species occurring there, whilst in Europe we have seven, and in the Eastern States of North America five or six.

Except in the case of the Euloria group (which are subtropical), none of the sections seem to favour one country or continent more than another; but the bulbs of Lilies belonging to different sections seem to have similar modifications in the same country. For instance, all those with stoloniferous bulbs are North-American, and all those with large oblique bulbs are Californian; whilst no European or Asiatic Lily has a bulb which could be mistaken for an American species by any one who was at all conversant with their peculiarities.

The annexed Map will show, as nearly as is possible on so small a scale, the habitat of the known species, though it is of course understood that the boundaries of their distribution cannot be indicated by the colouring when several of the species occur together in one district.

It will be noticed that there are some curious anomalies in their distribution, which coincides with that of no other genus with which I can call to mind. In the Euloria group we have a case which resembles that of many animals and birds in the same region. We find L. nigrivirens and L. philippinense confined to isolated mountain-ranges, and separated from any of their congeners by nearly 1000 miles of sea, or by a great extent of land, which, being uncultivated, on account of its climate, to the requirements of Lilies, is a perfect barrier against the extension of their range.

In the same way we find many birds confined to the isolated hill-regions of Southern India, whose nearest allies are in the Himalaya Mountains; but if the analogy between birds and plants holds good, I should expect to find Lilies in the high mountains of Java and Sumatra rather than in Luzon, whose fauna is less akin to that of South-eastern Asia than the fauna of Java, Sumatra, and Borneo.

Another point worthy of notice is the great difference between the Lilies of the Atlantic and Pacific States—thus establishing the fact, which has been so clearly shown by Prof. Asa Gray and Sir Joseph Hooker, that the zones of distribution of plants in the United States are longitudinal rather than latitudinal, and that the flora of the Pacific States has much less in common with that of the Eastern States than would be expected.
GEORaphICAL DISTriButIoN OF LILIES.

Note — In these maps the distribution of the known species is shown as nearly as is possible in keeping with the imperfect knowledge of their limits, which facts are marked in the margins of the maps. The yellow line indicates the zone belonging to the Thianthus and Erythronium group of plants. The names given the species belonging to the Erythronium group indicating the subgenera appended. The lines show the limits of the group as defined by Baker. Where two distinct zones in shape, it is understood that two species are met with scarcely distributed on the region named. Where the columns are given it shows that the species are restricted to tracts of their distribution.
INTRODUCTION

The range of *L. pyrenaicus* is perhaps the most curious of all, and cannot be accounted for by any known cause. An inhabitant of the Pyrenees, and perhaps of Central Spain, it is also found in Bosnia and Transylvania, but is entirely absent from the whole of the Alps of Central Europe (where it is represented by *L. pannonicus* and *L. carniolicus*), and again reappears, in the same or a very closely allied form, in the mountains of Kurdistan, at the south-east corner of the Black Sea.

The Lilacs of North-eastern Asia are much more specialized, and have less resemblance to those of Europe than analogy would lead us to suppose. *L. dauricum* is the only one which can be called a local variety of any European plant by the most determined advocate for the unity of species, whilst a great majority of the birds, plants, and insects of East Siberia are remarkably similar to those of Europe. To the Lilacs of North Japan, however, we find the closest similarity, several of the species, such as *L. himalae*, *L. monereae*, and *L. callius*, being identical in Japan and on the mainland.

The following Table shows the habitats of all the Lilacs:

<table>
<thead>
<tr>
<th>No.</th>
<th>Latin Name</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>L. catharticum</em></td>
<td>Northern Japan, and probably Central China.</td>
</tr>
<tr>
<td>2.</td>
<td><em>L. gregarum</em></td>
<td>Nepal, Sikim, Khasia hills, and probably East Tibet.</td>
</tr>
<tr>
<td>5.</td>
<td><em>L. nipponicum</em></td>
<td>Nepal.</td>
</tr>
<tr>
<td>6.</td>
<td><em>L. sibiricum</em></td>
<td>Mountains of Southern India above 6000 ft elevation.</td>
</tr>
<tr>
<td>8.</td>
<td><em>L. Brownii</em></td>
<td>Islands of Ocean archipelago, and probably adjacent mainland.</td>
</tr>
<tr>
<td>9.</td>
<td><em>L. candidum</em></td>
<td>Northern and eastern coast of the Mediterranean, in several scattered localities, though how for indigenous is very doubtful.</td>
</tr>
<tr>
<td>11.</td>
<td><em>L. pygmaeum</em></td>
<td>Coast-range of California, Marin to Humboldt counties.</td>
</tr>
<tr>
<td>12.</td>
<td><em>L. Parryi</em></td>
<td>San Bernardino county, S. California.</td>
</tr>
<tr>
<td>14.</td>
<td><em>L. japonicum</em></td>
<td>Central and South Japan.</td>
</tr>
<tr>
<td>15.</td>
<td><em>L. monereae</em></td>
<td>Central and South Africa.</td>
</tr>
<tr>
<td>16.</td>
<td><em>L. philadelphicum</em></td>
<td>Canada, west to the Saskatchewan, and south to North Carolina and Colorado.</td>
</tr>
<tr>
<td>17.</td>
<td><em>L. niiolus</em></td>
<td>Japan.</td>
</tr>
<tr>
<td>18.</td>
<td><em>L. cuneolus</em></td>
<td>Central and Northern China, Mongolia, and probably Japan.</td>
</tr>
<tr>
<td>22.</td>
<td><em>L. bulbiferum</em></td>
<td>Alps of Central Europe from France to Tibet.</td>
</tr>
<tr>
<td>24.</td>
<td><em>L. brevifolium</em></td>
<td>East Tibet, bordering on Szechwan.</td>
</tr>
<tr>
<td>25.</td>
<td><em>L. trinervum</em></td>
<td>Canada, from New Brunswick west to James River, and south to Georgia.</td>
</tr>
<tr>
<td>27.</td>
<td><em>L. carniolicus</em></td>
<td>Georgia, North Carolina. The range of these two species or varieties, which probably run into each other, cannot be defined.</td>
</tr>
<tr>
<td>28.</td>
<td><em>L. californicum</em></td>
<td>Coast-range and foothills of Sierra Nevada, from Central California northward.</td>
</tr>
<tr>
<td>29.</td>
<td><em>L. parvus</em></td>
<td>Sierra Nevada, northward to Oregon.</td>
</tr>
<tr>
<td>30.</td>
<td><em>L. columbianum</em></td>
<td>British Columbia to North California.</td>
</tr>
<tr>
<td>31.</td>
<td><em>L. catharticum</em></td>
<td>Marin and Humboldt counties, California.</td>
</tr>
<tr>
<td>32.</td>
<td><em>L. Hexscholitii</em></td>
<td>foothills of Sierra Nevada, and coast-ranges from Santa Barbara to San Diego.</td>
</tr>
<tr>
<td>33.</td>
<td><em>L. montanum</em></td>
<td>Central Europe, from France and South Sweden to Ural Mountains and Siberia eastwards.</td>
</tr>
<tr>
<td>34.</td>
<td><em>L. Revernii</em></td>
<td>Coast of N.E. Siberia and North Japan.</td>
</tr>
<tr>
<td>35.</td>
<td><em>L. carniolicus</em></td>
<td>Coast of N.E. Siberia and North Japan.</td>
</tr>
<tr>
<td>36.</td>
<td><em>L. scoulerae</em></td>
<td>Western Caucasus.</td>
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<tr>
<td>37.</td>
<td><em>L. plena</em></td>
<td>Japan.</td>
</tr>
<tr>
<td>38.</td>
<td><em>L. Leichlinii</em></td>
<td>Japan.</td>
</tr>
<tr>
<td>40.</td>
<td><em>L. callianthe</em></td>
<td>Japan and Amuriland.</td>
</tr>
<tr>
<td>41.</td>
<td><em>L. transcaucasi</em></td>
<td>East Siberia.</td>
</tr>
<tr>
<td>42.</td>
<td><em>L. polyanthum</em></td>
<td>N.W. Himalayas, and perhaps East Tibet.</td>
</tr>
<tr>
<td>43.</td>
<td><em>L. argyrolepis</em></td>
<td>Kumaun.</td>
</tr>
<tr>
<td>44.</td>
<td><em>L. ciliolamia</em></td>
<td>Greece, and probably Albania and Central Turkey.</td>
</tr>
<tr>
<td>45.</td>
<td><em>L. carniflora</em></td>
<td>Alps of Carniola.</td>
</tr>
<tr>
<td>46.</td>
<td><em>L. pannonicus</em></td>
<td>Alps of Levant.</td>
</tr>
<tr>
<td>47.</td>
<td><em>L. pyrenaicus</em></td>
<td>Pyreness, Bosnia, Transylvania, and perhaps Lusitan.</td>
</tr>
</tbody>
</table>
INTRODUCTION

CULTURE.

Though I have given directions for the cultivation of the various kinds of Lilies in the body of the work, yet I think some general remarks on the subject may be of use.

It is evident, from the large amount of correspondence which has appeared on the subject in the horticultural papers, that great diversity of opinion exists on the question; and though some writers profess to be able, by following out certain theories of culture, to ensure success, yet experience has shown that no amount of care or skill will enable us to grow Lilies unless the natural conditions of climate are favourable.

I know of no plants which seem to have such uncertain and incomprehensible constitutions (if that term can be fairly applied to plants) as Lilies; and I am more and more inclined to believe that in many cases they are not truly perennial. Whether this is the case or not, it is a fact (which no experienced Lily-grower will deny) that just as the perfection of development is attained, and the plant appears to be as flourishing as possible, a rapid decline in vigour comes on, without any apparent cause, and is followed by death, or by such complete exhaustion and collapse that any further pains and care are in most cases thrown away.

These remarks must not, however, be applied to all Lilies, as there are several species (such as L. candidum, L. bulbiferum, L. mortagnei, and L. californicum) which may be grown with reasonable ease almost anywhere, while others (such as L. Odoratus, L. Wallachianus, L. amorcarum, and L. washingtonianum) have repeatedly baffled the skill of the most experienced horticulturists.

Before considering the causes of this want of success, it will be well to examine the general conditions under which Lilies grow in their native countries; and there are three points worthy of especial notice:

First, a considerable degree of summer heat is requisite; and though this may be accompanied, as in Central Europe and the United States, by severe cold in winter without injury, yet we do not find Lilies thrive well in a cold, wet summer.

Secondly, we find that a good deal of moisture is necessary during the growing-season, either in the form of rain or mist. Long and severe droughts are not characteristic of any country where Lilies are abundant; or if they occur (as in parts of California and Southern Europe), we find Lilies only at considerable elevations, or growing in marshy and moist places.

Lastly, it seems to be almost universally the case, that the partial shade afforded by grass and weeds, or overhanging shrubs, is a necessary condition for their health; and perhaps this in cultivation is overlooked more often than any thing else. I have repeatedly found some varieties thriving in out-of-the-way corners, where they were almost buried in rank weeds and grass and quite unheared for; whilst the same plants in rich soil, but exposed to the sun, were weak and unhealthy.

Protection from wind, from spring frosts, and from the baking of the soil by exposure to sun, are, I think, the most important points to be considered; and if combined with these conditions we can obtain moisture at the root, and a considerable degree of warmth in summer and autumn, there is little doubt of success with the majority of species.

Rich soil, however, is of no use, unless it is sweet and well drained, as one finds, in pot-cultivation, that the roots will not occupy the good soil provided for them if it is at all sour or sticky. The constituents of the soil are, in my opinion, not so important as its condition; for though some Lilies, such as candidum and superb, certainly prefer a considerable admixture of peat, and refuse to grow in soil containing lime, whilst others, such as
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The great drawbacks we have to contend with in England are:—the heavy cold rains of autumn and winter, acting on the soil at a time when the roots are most inactive, and thereby frequently causing them to rot; and the late spring frosts, which injure the shoots when first appearing above ground.

Perfect drainage will no doubt help the plants to endure the first of these evils; and artificial protection will secure them, in many cases, against the second; whilst a liberal mulching of light manure, leaves, or compost—will keep the ground from becoming dried up in summer.

The insect pests which affect Lilies most severely are _Aphides_, or green flies (which are most injurious to them when grown under glass, and must be thoroughly kept down by fumigation and syringing), and a minute white insect which is generally found in abundance in the bulbs of unhealthy plants (but which is, I believe, rather the result than the cause of disease). A fungoid disease, resembling what is called "spot" in orchids, is often observed to attack the leaves of Japan Lilies in wet cold weather, and is, I have no doubt, caused by want of warmth. The disease which destroys so many thousands of _Lilium auratum_ does not, however, seem to be of a similar character, but is more probably caused by a lack of moisture at the roots, or the exposure of the buds to the sun. The sudden shedding of leaves, however, and death, which so often disappoint all one's hopes with this species, are very capricious; and perhaps, out of a hundred plants growing under precisely similar conditions, only twenty, thirty, or fifty may suffer, whilst the rest remain healthy and flower well.

Since the preceding was written, we have experienced in England one of the most protracted and severe winters, followed by one of the coldest and wettest summers ever known; and the results have been (as I anticipated) most disastrous to Lilies. My own losses have been so great that I have almost despaired of replacing them; and though in the drier soils of the eastern and southern counties I believe there have been fewer deaths, yet I fear the cultivation of these favourite plants has received a severe check. Perhaps the most remarkable case was that of a long bed of Californian Lilies, mostly varieties of _L. californicum_. These had become perfectly established in large clumps, and came up in the spring with unusual strength. After they had grown five or six feet high, and in most cases produced numerous buds, they became covered with blotches of decay, which spread rapidly over the whole plant. Week after week of dull and sunless or wet weather had apparently induced a somewhat similar disease to that which destroyed the potato-crops so generally in 1879; and the result was that they died off either without flowering, or with only a few poor half-opened buds.

A parcel of these stems was submitted to the Rev. M. J. Berkeley, whose experience in the fungoid diseases of plants is unrivalled. His report, as printed in the "Gardener's Chronicle," Aug. 23, 1879, is as follows:

"Ever since Lilies became a favourite subject of cultivation, amateurs have mourned over their tendency to become spotted and unhealthy. From time to time specimens have been submitted by one of our most zealous and intelligent cultivators to the Scientific Committee of the Royal Agricultural Society, but without eliciting anything at all satisfactory. No treatment or change of soil seemed to have any beneficial effect; and our own experience is in exact accordance. Whether in the conservatory or in the open air, we have never failed to see specimens in a wretched condition, and sometimes belonging to the very commonest species. Nothing, however, has ever equalled, as regards condition, what we now have before us. The disease is no longer confined to mere spotting, but affects the whole plant, extending even to the bulb, which will soon be in as deplorable a state as the plant itself. No potato-stem affected with the Peronospora was ever in a worse state than what we have before us. The condition may perhaps have been aggravated by the fact that, though the bundle of stems weighed barely above eight ounces, an extraordinary heat had been produced by their decomposition, which first attracted notice by the temperature of the letter which accompanied them. As the mass was so small, it was immediately
INTRODUCTION.

conjectured that the heat must have arisen from a peculiar tendency to decomposition. The consequent change of colour in the cells penetrates deep into the tissues of the stem; and in parts the leaves are passing into a gelatinous mass. At the same time there is no certain indication of the cause. There is not a trace of any parasite except Asteroma pellucida, DC., in an early stage of growth; and even supposing that the spotting were connected with this (which is not impossible from what we know of Asteroma roseum, which is so destructive this year), we fear that the closest consideration, as in so many other cases of disease, is not likely to suggest a possible remedy."

This somewhat melancholy report is, I am afraid, all I can add to the question of Lilly disease. Mr. G. F. Winsor believes that exposure to sun and wind is the primary cause of the disease; but if so, how is it that we often see a quantity of Lilies in a greenhouse go off in just the same sort of way, and without any exposure at all? Truly the matter is at present inexplicable; for it often occurs that, in the same house or bed where these sad deaths are taking place, other plants of the same species are flourishing exceedingly, and I know that even in the summer of 1870 Lilies did well in some places.

If I were about to recommence the cultivation of Lilies, I should build a house or frame on purpose for them, arranged, as nearly as possible, in the following manner:—

A span-roofed pit should be made in a sheltered situation, with the ends facing north and south, sunk about three feet in the ground, and having an entrance at one end, with a narrow path down the centre. The lights should be made either to slide down and take off like the lights of a frame, or be hinged that the pit could be completely thrown open when desired. I think this important, because the complete exposure of the plants to spring and summer rains when not too violent is of more benefit to them than any amount of spraying or watering; and by lifting or drawing off the lights, and replacing them with some shading material in hot sunny weather, we avoid the burning and drying up of the soil, which is so difficult to prevent under a fixed glass roof.

No heating-apparatus would be necessary, as the slight frost which might penetrate the house in very severe weather would not injure the plants when in a dormant condition. The brick sides of the pit would be about a foot or eighteen inches above the ground-level, and might have ventilators of pierced zinc to break the draught. The beds would be built up with brick to about ground-level, and the height of the ridge from the earth should be not less than seven feet, or more if it is desired to grow many plants of Lilium auratum. The beds would be composed of a drainage of 9 or 10 inches of broken bricks, stone, or tiles, covered by some sods of good soil laid over them, and filled in with about two feet of a compost consisting of about half light loam, onequarter coarse sand, and onequarter loose fibrous peat, well broken up and mixed together. A part of the beds might have a mixture without peat, and another part should be composed of half peat and a quarter leaf-mould; but care must be taken that any leaf-mould used for Lilies is thoroughly rotten and free from fungid growth. Decayed coconuts-fibre has been found an admirable substitute for leaf-mould, and may even be used instead of peat, though I should prefer the latter when of good quality. A good sprinkling of broken corks, small stones, or clean coarse gravel may be mixed with advantage through the whole mass of soil; and a mixture of broken charcoal is also advantageous, as until the roots of the plants have occupied the soil there is always a risk of its becoming sour; and I believe that charcoal will not only prevent this, but also enrich the soil.

If the house could be planted with bulbs already well rooted and established in pots, I should prefer it, as among a number of purchased bulbs there will always be many failures, and there is some danger of their decay affecting the soil. If however, the entire stock of plants was purchased, I would not plant them out till they had begun to make root, as it frequently happens that bulbs which have been lifted and severely checked lie dormant for several months; and when in this state they are likely to rot if kept at all wet.

In a part of the house a bed should be kept for pluming plants in pots, so that newly imported bulbs
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might be kept in small pots until they had made a good start. However large a bulb may be, and whatever depth of soil it may require when established, it is always good policy to start it in a small pot, and either shift it to a larger one or plant it out when well rooted. It is also unsafe to put more than one newly imported bulb in the same pot, or to plant a number together, where a good effect is desired, until their season of flowering has been ascertained. It frequently occurs that in a batch of imported bulbs of L. martensii and others, some will begin to flower in June and July, and others not before September, October, or even November; and the beauty of a pot or clump is somewhat marred when withered stems are mixed with those in flower.

When our Lily-house has been once established, it will be necessary to keep a most careful look-out for Aphis, which, if once allowed to get strong, will hide themselves in the young leaves, and do much damage unseen. A frequent and regular fumigation in spring and summer is essential to keep them in check; and if this is done regularly, the cultivator may be at ease, as neither thrips, mealy-bug, or red spider is to be feared in an unheated house. The lights should be thrown off whenever the weather is warm and pleasant, and whenever there is a nice mild rain. If none falls, a thorough good soaking of soft water should be given occasionally to all plants which are well rooted and growing freely, and more moderate supplies to the rest. A good syringing when the house is shut up in the evening during the spring and summer months is also of great advantage.

During hot sunny weather the lights should be removed, and replaced by a shading of tiffany or some similar material, and care must be taken on no occasion to burn the plants by keeping the lights on without shade; for though some of them will stand a great deal of direct sunshine without apparent injury, yet serious results often ensue.

As soon as the Lily-grower is fairly acquainted with the various species, which only experience can make him, he will be able to select for himself those species which he prefers. Many Lilies are unsatisfactory plants to grow, and will probably disappear of their own accord in a year or two.

In purchasing bulbs, let him always select those which are plump and fresh, though of moderate dimensions; the largest bulbs are rarely the best. Let him endeavour to procure all home-grown varieties as soon as possible after they have been taken up in autumn; for if kept in sand or coconut-fibre all the winter, as is often done by nurseriesmen, they must lose some of their moisture, and will be slow in beginning growth. With regard to imported bulbs, however, those are usually best which arrive in January and February; for if taken up in Japan early enough to allow them to be sold in England before Christmas, they are often imperfectly matured.

Care should always be taken, when purchasing bulbs during or after a severe frost, to see that they are not affected, as much loss is often incurred by this cause; and for sending bulbs to friends, at home or abroad, mild weather should always be chosen.

With regard to packing Lily-bulbs I can add little to what I have said in speaking of L. philippinense. The great point is to observe the happy medium between too much moisture and the reverse, and to pack them so tightly that, without crushing, they may keep firm in the box.

During the last two years a new mode of cultivating Lilies has been suggested and put into practice by Mr. Watson, of Weybridge. This gentleman, believing that want of shelter was the main cause of failure in many instances, has laid out a piece of boggy woodland as a wild garden, and planted in it thousands of Lilies in various positions. Though I have no doubt that, if the various beds are kept from being overgrown by rank weeds and fern, many of them will prove very successful, the soil being very suitable for most of the species, yet I am inclined to think that the shade of the trees is too great at present; and that in a dry summer their roots will suck up so much of the moisture that the Lilies will suffer in consequence.
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Considering, however, the very unfavourable season of 1878, and the want of time to establish the plants, Mr. Wilson's experiment promises a considerable measure of success, and is certainly a very interesting one. I am not, however, inclined to believe that he will succeed in establishing all or nearly all the Lilies in a wood any more than in a garden; and, considering the varied nature of their habitats, it is not to be expected that he should in all cases succeed.

A theory which has been started and written on at great length by a correspondent of "The Garden," signing himself "Denison," as to the annual renewal of the bulbs of Lilies, is, I believe, founded on an entire misapprehension of the functions of their bulbs.

This writer, as far as I can understand his very lengthy communications, maintains that the bulbs of a Lily is completely absorbed by the flowering stem, and entirely renewed annually by a new growth of scales in its interior. He reasons therefore that the proper season to lift and transplant the bulbs of Lilies is immediately after the flowers have withered. The generally received opinion that the leaves of the plant have considerable influence in maturing the growth of the bulb, and assisting it to store up the necessary nourishment for the next year's flower-stem, is ridiculed by this writer; but, in the correspondence which took place in "The Garden," his theory was, I think, successfully disproved by several of our best Lily-growers. I believe myself that a continuous growth of new scales from the axis of the bulb is constantly taking place at all seasons, though much more actively in the spring and summers, and that this growth only ceases when the bulb has attained its maximum development or when checked by removal, or by some other cause affecting its health. The development of the seedling plants as examined by M. Duchartre certainly bears out this opinion.

The propagation of Lilies is effected in various ways,—first, by division of the bulbs, which increase rapidly in most of the European and in many of the American and Japanese species; secondly, by planting the bulblets which are formed in the axis of the leaves of L. reginae and L. hollifera, and at the crown of the bulb or on the base of the stem in many other species; thirdly, by seed, which, though a tedious and somewhat difficult process, is, in many cases, the only way by which an increase can be obtained. For instance, L. Washingtoniae, Hamboldtii, echinatum, polyphyllum, Catesbaei, philadelphiae, never, as far as I have seen, increase themselves by division or bulblets, whilst in the case of L. plicatulum, candicans, transilvanicum, and publithum seedling seems to be the normal manner of reproduction. Judging from the groups in which we find Lilies growing in their native habitats, many species, such as L. eecnavum and L. plicatulum, which in gardens increase more readily by offsets, are propagated by seed under natural conditions.

Germination takes place very irregularly in different species, and according to the time at which the seeds are sown. As a rule, it may be said that, if sown as soon as ripe, the seed will germinate in spring; but under glass it often comes up sooner, as in the case of L. transilvanicum and L. longiflorum. If the seed is kept till spring before sowing, it usually lies a year before germinating, and sometimes longer; and if more than six months old, it very often does not come up at all.

The only seeds of L. candidum which I ever sowed came up in September, at the same time as the autumnal leaves of the parent plant; and I have observed that the germination of the seeds of other bulbous plants usually takes place at the same time as the vegetation of the same plant. The seeds should be sown in boxes or in a frame, about a quarter of an inch deep, in light soil; and the ground should be made tolerably firm under them. If sown in pots, they must be kept plunged, or the young bulbs will soon be starved; and as soon as strong enough they should be turned out into a frame.

As seedling Lilies grow very slowly for two or three years, they should not be planted in the open ground at first; and careful watch must be kept against slugs, which will devour the leaves of seedlings in a single night. Moss is very apt to grow over the soil and choke them; drought is also very injurious; so that, from one cause or another, it is astonishing how small a proportion of seedling Lilies ever come to the flowering stage. One or
two species, such as *L. longiflorum* and *L. tenuifolium*, will flower the third season after sowing; but the majority, and especially the *Martagon* group, take six to ten years before they attain flowering size.

It has been supposed by some that the constitution of Japanese Lilies may be improved by raising them from seed in this country: and there is no doubt something to be said for this theory; but, putting aside the extreme care and patience which are necessary, I think experience shows that deterioration of size and colour is the usual result.

Certainly the Japanese Lilies which are cultivated by thousands in Holland are inferior in the size and tint of their flowers to those imported from their native country; and though I believe this is not the case in America, yet the climate of the New-England States is much more like that of Japan than is the climate of Holland or England. I have not noticed that the home-grown bulbs of *L. morium*, which have succeeded so admirably in the garden of Mr. McIntosh, are more easy to grow in my own garden than imported ones; and though I believe Messrs. Watterer and Noble have found the soil of their nursery very favourable for the propagation of Japanese Lilies, yet I believe we shall always be more or less dependent on a foreign supply to keep up our stock.

A fourth mode of propagation is by scales, and consists in pulling off the scales of sound bulbs and planting them separately, when, in some cases, small bulblets are formed at the base of the scale, which in time grow to be bulbs. This mode is most commonly adopted with *L. speciosum* and *L. auratum*.

The hybridization of Lilies has been attempted by many cultivators, but seems to have produced little result; and in many cases, where all means have been taken to remove the authors of the seed-bearing plant before maturity, the produce has shown little variation from the parental type*. Some of the varieties of Orange Lilies now in cultivation are supposed to have been raised by crossing *L. elegans* with *L. croceum*; and plants are sometimes noticed in gardens which present characters leading one to suppose that they may be hybrids between other species. The only well-known cases in which there appears to have been a decided success in crossing are those of *L. testaceum* (which is believed with good reason to be the result of a cross between *L. chalcedonicum* and *L. candidum*) and *L. Periamus* (which was raised in America by crossing *L. morium* and *L. speciosum*). Other supposed hybrids have been mentioned in the gardening papers, most of which have an American origin; but from some cause or other they do not maintain their position, and either die away from a delicate constitution, or lose the characters which mark them. A wide field, however, is open in this direction to the patient observer, as there seems to be no physiological reason why Lilies should not be subject to the same laws as other plants.

* For further particulars on this subject see the account of *L. Periamus*. 

INTRODUCTION.
Lilium Philippinense
LILIL PHILIPPINENSE.

THE PHILIPPINE LILY.


Bulb ovate, perennal. Stamen 1-2-petalled monocyclics graciles teres glaber viscosus vel purpureus maculatus. Folia 30-40
 spurae seminum falcato-orientis angustae lanceae 2-3 poll. longae, 1½-2 lim. latae, glabres ciliatae viridico-brunneae. Pericymum
 horizontaliter clavus ovatus praepe basi leviter viridii velum inunagineum inflatum phyllanthum 7-10 poll. longum, tubo praepro maximum
 seminaceum cresce, segmenta oblongo-elliptica spiculatam lancea lancea longa angusticulata ad basi quartae superioris 15-18 foliis,
avincis planis implexitatis carina obscura striatit. Stamina perianthia plano leuca filaminis filaminis leuca declinatis
 1-2 poll. longis, anthorius 2½-3 lim. longis, pollinis flavo. Stylos ovato ovato perianthia seminaceis brevior. Capsula ignota.

Beh. Inland Luzon in montibus dist. Benguet, alt. circa 7600 ped., nuncus Julius Pears [J. Wallis, qui solus invent].

Bulb oval, perennial, resembling that of L. longiflorum, but smaller and more pointed at the top. Stem 1-2 feet high, hardly
 as thick as a quill, tender, glabrous green or mottled with purple. Leaves 30-40, scattered all down the stem from within a
 short distance of the flower to the very base; narrow, lanceolate; spreading, 2½-4½ inches long; ½ inch broad, bright
 green, glabrous, narrower to a point; the lower not materially longer or broader than the upper ones. Flower solitary, or
 rarely two, spreading horizontally from the stem or slightly inclined upwards, pale white, with only a faint tinge of green on
 the outside towards the base, with a pleasant scent like that of L. longiflorum: the most narrowly funnel-shaped of all the
 known Lilies, 7-10 inches long (J. Wallis), the tube, which is ½ inch thick at the base, not being more than ¼ inch thick
 three times up (probably in wild specimens rather thicker); the oblanceolate divisions spreading only near the tip, their
 greatest breadth a quarter of the way down, where the outer measure 10 lines and the inner 1½ inches across. Perianth
 thickened below the base of the flower; filaments greenish white, 5-6 inches long, scarcely at all declinate; the lanceo-
 oblong anthorius, which are a quarter of an inch long, with yellow pollen, just reaching the throat of the expanded flower.
 Style green, with the ovary within half an inch as long as the segments, so that the stigma is rather protruded when the
 flower is open. Capsule and seeds unknown at present.

The beautiful plant with which I have chosen to commence my work is one as yet hardly known either to
 botanists or horticulturists; and as it only exists in a living state in the hands of Messrs. Vrett and Sons,
of Chelsea, I must express my sense of gratitude to those gentlemen for allowing me to use their plant for the
 illustration of this work before it has been distributed to the public.

Its history is as follows:—Mr. G. Wallis, the well-known horticultural traveller and collector, being in 1871
 on a journey in the Philippine Islands (the main object of which was to procure the numerous and lovely Orchids
 for which these islands are celebrated), discovered and sent to Messrs. Vrett the plant in question, which flowered,
 for the first time in Europe, at their nursery in 1873. It was described by Mr. Baker in the 'Gardener's Chronicle'
 for August 25, 1873, where a figure of it is also given. The occurrence of a Lily in a country where the vegetation,
as far as known, is of an essentially tropical nature, though quite unexpected, is not so extraordinary as it at first
 appears—the Philippine Islands having, with regard to the geographical distribution of their fauna and flora, many
 points in common with China, the Himalaya, and Southern India, in all of which regions Lilies, and Lilies of the
 same section (Eulerina), are found. With the exception of L. stipitatum, however, it is the only Lily found
 within the tropics (unless, perhaps, L. longiflorum, which occurs in Formosa, is another); and these are both
denizens of high mountains, where the climate is very different, both as regards temperature and moisture, from
 that of the surrounding plains.

Through the courtesy of Mr. Wallis I am enabled to add some information on the discovery and habitat of
 this plant, and translate from his letter as follows:—"It was in the beginning of July 1871, when I was in the
 district of Benguet, in the island of Luzon, at an elevation of 7600 feet, that I was surprised with this magnificent
 discovery. The spot required for me a special charm, as I found in the same place a Rhododendron with pure
 white flowers, and quite as suitable as the Lily to be brought into cultivation.

"If the Lily is said to be the emblem of peace and modesty, it is indeed true of this charming new species,
 the size of whose flower is, in proportion to that of the stem and leaves, greater than any other. On steep banks,
 where hardly any other flower appears, it is found half-concealed among the grass, and betrays its presence as much
 by the sweetness of its perfume as by the dazzling whiteness of its flowers. The stem, hardly thicker than a
quill, and clothed with unusually fine and grass-like leaves, is not more than from 6-18 inches high, while the flower, which is rather inclined upwards than horizontal, is from 8-10 inches long. It seems to prefer slopes where the soil is poor rather than rich, and grows by hundreds in small patches, partially shaded by overhanging trees. The soil is of a very light nature, allowing the abundant moisture to pass off freely, and is composed of a mixture of loam with decomposed trachyte and coralline limestone. The trees which grow in the vicinity consist of species of Quercus, Ficus, Rhus, Nux-vomica, Sassafras, Stachysbyzantina, Mikastanum, Consolea, and some stately tree ferns. The sublilicine character of the situation, however, is better shown by the herbaceous plants, among which are included species of Vitis, Compositae, and Anemone. Lower down the mountain Orchids and other tropical plants were abundant. Among these that I particularly noticed were Cypripedium argus and a Cypripedium resembling silnbus. With regard to the probability of other species of Lily existing in the Philippines I can say but little, the mountain-ranges of these islands (which attain the elevation of 10,000 feet or more) being almost unexplored. In the islands of Mindanao and Mindore, owing to the partialities of the natives, it is almost impossible to travel, though I have no doubt many fine discoveries might be made there. The only other high mountains I ascended were the Mihalau range in Luzon; and here I was disappointed by finding nothing so remarkable as in the district of Benguet.

"I was afraid that the bulbs of L. philippinense when brought to the warm climate of Manilla would soon decay; but, thanks to the vitality of their scales, each of which seems to have the power of producing a tiny bulblet, I was enabled to bring them safely to England."

I would here add that the main point to be attended to in packing the bulbs of Lilies for transport is to protect them from heat and excessive moisture, which soon destroys them when deprived of their roots. Thousands of bulbs have been lost from ignorance or inattention to this fact; but, on the other hand, care should be taken not to allow them to become overtly dry from exposure to the air, which soon shrivels up the fleshy scales of which they are composed. No substance is better for packing small parcels of Lilies than excusant-leaf, which can be obtained in most parts of the world. Failing this, light vegetable soil, not too moist, or sawdust is the next best thing; and care should always be taken to pack them so tightly that they cannot be shaken in the box. In cases where the plants cannot be allowed to remain until their stems have naturally decayed in autumn, it is better to transplant them, with the roots as fresh as possible, to some shady spot in a garden until they are at rest, than to pack and send them off when in full growth. Before packing for a long journey, and especially if hot climates have to be traversed, it is a good plan to expose them for a few days to the air, which will dry up the superabundant moisture of the outer scales and render them less liable to rot. However carefully packed, most Lilies are still injured by a long transport, and do not make healthy growth for a year or more after they are replanted. Growers of Lilies, remembering this, must therefore not be disappointed if the flowers of some new and perhaps highly prized introduction are poor and colourless, or perhaps altogether absent, for a year or two—but patiently waiting till the plants have recovered their natural vigour will be rewarded by a display which cannot fail to give pleasure to those who can appreciate their delicate beauty.

With regard to the culture of L. philippinense, I am informed by Messrs. Verneuil that the bulbs are somewhat delicate, and grow best in a warm house in small pots plunged in a bed of fibre or soil. When growing they require, like other Lilies, abundant of moisture, and when at rest should be kept plunged in a cool house where the pots, without watering, may never become quite dry. In February the bulbs will start into growth in a temperature of 50°-60°; and the delicate stems then begin to show the character of their narrow leaves. The leaves produced by small bulbs or scales are much like the primary leaves of L. tenuifolium. It is to be hoped that the stock of this plant, under the tender care of Mr. Dowey (who is undoubtedly one of the most skilful gardeners of the day in all delicate operations of plant-culture), will soon be sufficiently increased to enable Messrs. Verneuil to send it out. In the mean time let us hope that the islands whence it came may not long remain, as at present, almost a terra incognita to naturalists.
LILUM HANSONI.

HANSON’S LILY.


L. maculatum, Bot. Mag. pl. 6196.

L. monencum, Maxim. in Gartenflora, 1865, p. 290, in part.

Bulbs et tepiis similis, globosus personis compactus albidos. Caulis 3-4-petalli glaber tenuius robustus violae. Folia oblongo-ovata acute violae teres glabraennis integraulis 3 obtusae teres distinctionem, expansis 8-12 in verticillum uncinum ad medium caulii aggregata patens secundum, refixa superne, 4-5 poll. longa, supra medium 8-12 lin. lata, ad medio ad basim secundus angustata. Flores 4-16 in racemoneum horne dispositi, rei in umbellam congruam, pedicellis erecto-potentibus 1-2 poll. longis, bracteis parvis erubescentibus. Pericarpiis 16-18 lin. longum splendidum rubellus-oseouscarinum, segmentis erudis biconchis medio 4-5 lin. latum, praeface subasto-rectulis, faciei dimidio Inferiori purpuraco-pontiis, florecum longa glabra profunde exsarata praeditis. Florastrum 12-18 lin. longe lateris, anthora angustis 4-5 lin. largis, pollinis flavis. Ovarium elatum profunde sub instructum 5-6 lin. longum, style paulo brevius.


Bulb large, round, compact, formed of many closely adherent white scales, resembling that of a Tiger Lily. Stem 3-4 feet high, stiff, erect, bearing 5 or 4 whorls of leaves at considerable intervals, the lowest one some way from the ground. Leaves narrow when young in a whorl, broad when few, sessile, 3-6 inches long by 1-1½ broad, oblong-elliptic or elliptic, pointed, 5-6-nerved, dark shining green above, paler beneath; upper leaves scattered, much smaller. Flowers about 4-10 or more, irregularly roemose; peduncles 3-5 inches long; heares broad, green, hairy. Perinex-segments 15-18 lines long, orange-yellow, spreading and recurved, but not so much as in the Marљruse, spotted with black towards the middle. Flowers shorter, 10-12 lines long; anthora narrow, 4-5 lines long; pollen yellow. Ovary elate, deeply sulcate, 5-6 lines long; style rather shorter. Perfect capsule unknown.

This fine and very distinct lily is of very recent introduction, having been named by Mr. Baker from a plant in Mr. Leichtlin’s garden only last year. As its history, however, is rather an intricate one, I will give it fully.

The plant was first discovered by Professor Maximowicz, the distinguished Russian traveller, in Siberia and Japan, about the year 1869, at the Victoria Gulf in Eastern Manchuria, the southern limit of Russian territory in those regions. He did not, however, especially notice its distinction from L. monencum, which is indeed very slight; so that it is mentioned in the ‘Gartenflora,’ 1865, p. 290, as a yellow-flowered variety of that plant. In 1868 or 1869 two or three bulbs were sent to the garden of the late Baron von Siemens at Leyden, and were purchased a year afterwards by Mr. Leichtlin, who saw at once that it was a very distinct species. He grew the plant and named it after Mr. Hanson of New York, who has one of the finest collections of lilies in the world.

Before this became known, however, Mr. Wilson had bought one or two bulbs in an odd lot at Stevens’s sale-rooms, where many thousands of lilies are annually disposed of, not knowing exactly what they were. Early in the following spring he was gratified by seeing a stem shoot up before any other lily had begun growing; and in due time the flowers were produced. He exhibited the plant in June at a meeting of the Royal Horticultural Society; and it was figured soon afterwards in the ‘Gardener’s Chronicle’ under the name of monencum, in the ‘Florist and Pomologist’ as L. maculatum, and in the ‘Botanical Magazine,’ pl. 6126, as L. monencum (of Thunberg), with the synonym of monencum.

Mr. Leichtlin, however, on seeing these figures at once recognized the plant, and wrote to point out that though the flowers and stem might be very similar to those of monencum, the bulb was remarkably different.
This I have verified by personal examination, having seen excellent specimens of the latter with bulbs in several herbarias; and though it is not now in cultivation, there can be no doubt that Mr. Linnæus is right.

The habitat of the plant, however, still remained unknown; for though it is certainly found in Japan, no travellers had met with it in a wild state, and it might be, like several others, only introduced to the gardens of Japan.

A few months ago I was able to show a plant of this species in flower to Professor Maximowicz, who at once recognized it as what he had discovered at Victoria Gulf and previously supposed to be L. aestivum. It is quite possible that the plant may have been known before, as it was certainly sent to America several years ago, and has been again received by Mr. Meehan direct from Japan; but the mystery which hung over its origin has now been, I hope, satisfactorily cleared up.

I may add that the name of macrocarpum (Thunb.), which was thought to have been given to this lily, cannot stand, the type specimen in Thunberg's own herbarium (which, through the kindness of Professor Fries, of Upsali, has been sent to the Kew herbarium for examination) being nothing more than a garden variety of L. elegans.

I have seen, in a book of drawings of Japanese lilies very well and truthfully done from nature, by a native artist, unmistakable representations of both L. heissoii and L. aestivum—showing that they are recognized as distinct by the natives of that country, and may both be found in the northern parts of the archipelago.

The culture of this plant is so easy that I have no doubt it will soon become better known in gardens. A small bulb stood the severe frost of last winter in my garden without any protection; and though it does not ripen seed in this country, it may be propagated by means of scales and offsets. It is the earliest in growth of any kind I know, and succeeds well in a peaty soil which does not become hot and dry in summer. The only seed which has been obtained by Mr. Linnæus germinated at once, which is not the case with the Martagon Lilies, from which this plant is also distinguished by many characters of bulb, habit, and shape of flowers.

P.S.—From information I have quite recently received from Mr. Higo, an American gentleman long resident in Japan, I have no doubt that the plant is found in the northern part of the Japanese archipelago, and I am promised by him a full account of all the lilies of that country in their wild state, about which we yet we have very little knowledge.
LILILUM POMPONIUM.

THE POMPONE LILY.


L. rubrum, Linn. et DC. Gall. iii. 212.

L. anepistemon, Mill. Dict. no. 6.

Bulbous cufidens peregrinus squamos planibus lanceolatis, 3-5 poll. crassus. Camis 1½-2½-petalis. Folia anguste linearis ascendentia. 5 poll. longa, ½ in. lata, magnificis minute papillosis 1-3-seriatum. Pedunculus 2-4 poll. intra rosumius undas. Basimnus 1-6 vel heros multiflorum, pedunculis apico cunei semi brevissimis. Perianthium 1-3-2 poll. longum, miniatum, intus papillosum et ligne-panchera segmentis crasso recurvatis oblongatissimis 3-4 lini. lata, florula glabra distincte carinata, parvispilosissima. Filamenta 12-14 lini. longa, suavem 3-4 lini. longum; pollinium miniatum. Ornamenta 3-5 lini. longum, style-panic bracteum. Cupula obvoidea, ½ poll. longa, apice umbilicata subacuto tumidula.


Hab. perennial, cool, though smaller than that of papaverum. Stem 1½-2½ feet high, stiff, erect, slightly swayed, naked below the leaves. Leaves very numerous, scattered, crowded, linear, 2-4 inches long below by ½-2 lines broad, above shorter and narrower, very finely but exceptionally ciliate at the edges, apparently white-edged and slightly incised. Basimnus 1-6, or in gardens many-flowered. Pedicel recurved at the tips, sometimes bracteolatus. Perianthium 1½ inches deep, bright yellow-red, the base papillose within and minutely spotted with black, the divisions lanceolate, reflexed from below the middle, subovate at the top, the groove glabrous. Ovary ½ poll. long; style slightly longer, much curved; filaments 12-14 lines long, anthers 3-4 lines long; pollen red. Cupula obvoidea, ½ inch long, umbilicate at the end, blantly-6-angulat.

Hab. Maritime Alps.

The Pompone Lily, though well known by name, is by no means a common species. I have indeed great doubts if the true plant was known in our gardens until recently, though it was grown in the last century, and is one of the oldest known to science.

To Mr. G. May, of Benthall, whose frequent excursions to all parts of Southern Europe in search of plants have made his name so well known of late years, must be attributed the credit of reintroducing the real L. pomponium of Linnæus, and of pointing out its distinction from the common garden plant of that name. It is true that Mr. Baker, in his last revision of the genus, places L. papaverum, the red variety of which is the pomponium of gardens, as a variety only of the latter; but I think that if he had at the time seen such a plant as I have figured, in a living state, he would have allowed its claims to specific distinction. I am indebted to Mr. May for the plant from which this drawing was made. It was procured by him in the Lantosca valley of the Maritime Alps in 1873, and flowered in his garden at Benthall in June 1875. It may be distinguished from papaverum by the numerous crowded, narrow, linear leaves, the very large stamens and wanting papillose, as well as the colour and size of the flowers, which make it a handsome plant than any variety of papaverum I have seen.

Mr. May, who brought a large quantity of the bulbs of this Lily to England lately, informs me that it is found in the following localities, all of which are in the Maritime Alps. — Lantosca (at about 1400 ft. elevation), mountains above Mentone (at about 2000 ft.), Grasse, Le Var, Grimaud, Castellane, Sorgon, Aiguan, Le Mas, St. Vallier, Colle dell’ Ortigiera, Valle del Minier, &c. *

Its cultivation is perfectly simple; and, like all the Martagon group, it only requires to be planted in good soil and left undisturbed, when it will increase rapidly and flower freely every year. I am glad to hear that Messrs. Barz and Seccies have succeeded in obtaining from its native country a good supply of this pretty plant, which will soon become a general favourite.

* Willoufih and Lardus, in their "Prodromus Phcenici-Italianus," mention the occurrence of L. pomponium in the mountains of Burgos, Spain; but this probably refers to the red variety of L. papaverum.
cross; but they have invariably turned out to be of the *speciosum* type. I have likewise flowered some seedlings raised from the red-barred seedling *auratum*, making the *speciosum* the male parent; and they have all shown on flowering the *auratum* shape, but very much in their markings, some being with red bands and some with yellow. All these crosses were carefully performed, the anthers being all removed before any pollen appeared on the stigma of the flowers crossed. I have likewise flowered between 400 and 600 seedling Lilies of the *speciosum* and *auratum* varieties within the last few years; and it is remarkable how they vary in shape of the petals and markings; but, as mentioned above, they have never shown any decided cross between the two kinds. Of the *speciosum* type I have raised pure white kinds and pink-spotted ones on a white ground, like *speciosum punctatum*, up to a very dark-spotted on a deep crimson ground. In raising seedling Lilies of the *auratum* and *speciosum* kinds it is very easy to see if there is a cross between them, by the shape of the leaves and markings on the stems, long before the flowers appear—the leaves of *auratum* being much narrower than those of *speciosum*, and the stems spotted."

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**LILIUM AURATUM, VAR. WITTEI.**

WITTE'S LILY.


*L. virginiol*, Hort.

Of the origin of *Lilium auratum*, var. *Wittei*, I can say little. It was first described by Prof. Suringar, of the Botanic Gardens at Leyden, as a distinct species, from a plant in the possession of Messrs. J. Van de Leuwen & Son, of Rotterdam, who received it from Japan.

It was then purchased by Mr. J. H. Krelage, of Haarlem, who is probably the largest grower of Lilies in the world, and to whom my best thanks are due, not only for the kindness with which he has always placed at my disposal his great knowledge of Lilies and bulbous plants generally, but also for allowing me to have the Plate, which was drawn from his plant, lithographed for this work. Curiously enough, at the very time that Mr. Suringar was engaged in doing so, a bulb of *Lilium auratum*, which I had purchased in the preceding winter among a lot, produced four stems, each bearing one or more flowers so exactly like the figure of Mr. Krelage's plant that there can be no doubt of their identity. What has been grown and exhibited, on more than one occasion, in England as *Lilium virginiol*, is, I think, the same, or almost the same, variety; and I am informed by Mr. Wilson, of Weybridge, that, out of forty seedlings he raised from *L. auratum*, three produced flowers nearly resembling this. The last fact is a conclusive proof of the specific identity of the plant with *L. auratum*; and, though quite scarce at present, I believe it will turn up every now and then among the numbers of bulbs which are annually imported from Japan, and which I believe are mostly wild seedlings, transplanted and cultivated in gardens on purpose for exportation. A full account of *L. auratum*, together with other distinct varieties, will be found in a separate article.
LILium PARKMANNI, HYB.

PARKMAN'S LILY.


Sura slender. Leaves none acuminate, alternate, freeserved. Flowers very large, 8-12 inches across, shaped like those of L. aeriatum, but with the colours of speciosum. Base of the perianth-segments greenish. Style green, with purple stigma.

A hybrid between L. speciosum, the female, and L. aeriatum, the male parent.

I THINK it unnecessary to give botanical descriptions of the two magnificent plants here figured, as their peculiarities of form and colour are better shown by the Plate than expressed in words.

The history of L. Parkmani is as follows:—It was raised by Mr. Francis Parkman, of Jamaica Plain, Mass., President of the Massachusetts Horticultural Society, who gives the following interesting account of it in the ‘Gardener's Chronicle’ for 1865, p. 356:—

""I sent, last year, to Mr. Anthony Waterman a small bulb of a hybrid Lily, raised by me between L. aeriatum and a deep-coloured variety of L. lancifolium (speciosum); the latter was the female parent. Impregnation took place readily; and the young bulbs were planted in the open ground for the first time in the spring of 1869. There were about fifty of them. Several, as they grew, showed the peculiar spotted stem of the male parent; but when they set flower-buds, as nearly all of them did in the same season, I could distinguish the features of L. aeriatum in only one of them. The rest, in bud and flower, appear to be merely L. lancifolium, quite unaffected by the pollen of the male parent.

""The one case alluded to was a remarkable exception. The flower opened ten days earlier than any of the rest; its colour was a deep red; it had the fragrance of aeriatum, and resembled it also in form. This first flower measured 9½ inches from tip to tip of the petals. In the following year there were several flowers, of which the largest measured 11½ inches. The bulb was then in a pot. As no special pains or skill was applied to its cultivation, I have no doubt that the flower might be grown to the diameter of a foot.

""This hybrid was the most successful result of a great number of experiments tried by me in the cross-fertilization of Lilies. This genus is certainly remarkable in the tenacity with which it preserves the characteristics of the female parent, and resists the influence of the male. Thus I impregnated L. lancifolium and its variety L. Tuberosa with the pollen of L. aeriatum, L. lancifolium, and six or eight other Lilies, the authors of the impregnated flower being carefully removed before they ripened. L. Tuberosa bore seed in abundance; but the resulting plant did not differ perceptibly from its female parent, showing no feature of the male. I removed its anthers, and fertilized it again with aeriatum and lancifolium, thinking that the influence of the male might appear in the second generation if not in the first; but this double impregnation produced no effect. The same result followed a similar experiment with L. costarum and L. superbum; in this case also, the flower resulting from the first impregnation was again impregnated: the result was a very scanty crop of seed; but this seed produced a plant in which no sign of the male influence was visible."

"In 1875 the plant flowered in the celebrated Rhododendron-nursery of Mr. Anthony Waterman, at Knapp Hill, where it was drawn by Mr. Fergus for the ‘Florist and Pomologist,’ and described by Mr. T. Moore, to whom I am indebted for permission to use that drawing for my work. It is without doubt one of the grandest Lilies known, but, I am afraid, will never become common in this country, as the want of constitution shown by a large majority of the bulbs of L. aeriatum makes them very liable to go off suddenly without apparent cause; and, when once out of health, they are very difficult to recover. I am glad to hear that it has got into the hands of Herr Lichtenau, as, if it is possible for any cultivator to increase it, it will be done by him.

"With regard to the little-understood subject of hybridization among Lilies, I would here call attention to a communication by Mr. Talley, of Welbeck, to the ‘Gardener's Chronicle,’ 1876. He says:—'For the last seven or eight years I have been trying to effect a cross between a dark seedling L. speciosum and a seedling L. aeriatum with a deep-red band, making the speciosum the female parent. I have flowered some of the seedlings from the
LILIJUM PYRENAICUM.

THE PYRENEAN LILY.


L. paeoniflorum (?), Bot. Mag. t. 798, et hortecm.


L. albicans, Schr., Transp. 522.


Bulb longo, rossidico, perecanum. Stem 2-4 feet high, strong, stiff, erect, finely narrowed, subglabrous, bearing leaves nearly up to the raceme. Leaves scattered, numerous, ecrct-petalo, linear-lanceolato; below 2-6 inches long, 2-8 lines broad at middle, narrowed to base and nearly pointed. Distinctly 3-5- مر: the edge somewhat rolled and minutely ciliate, though this is not always the ease in cultivated plants. Flowers 1-12 or more in racemes, not forming so erect, regular, or elongated a racemosus as in L. paeoniflorum. Lower pedicelli 3-4 inches long, generally lanceolato. Pedicelli pedunculato, 12-2 inches long, yellow, tinged with green at the base and in the throat of the flower, and spotted profusely with blackish papilla. The divisions reflexed from below the middle, lancetali, 3-4 lines broad. Filamenta 1 inch long, anthers 2-4 lines; pollen red. Style thicker than in paeoniflorum. Capsule 12-15 lines long, 8-9 lines broad, with an umbilicate apex.

Har. Pyreneae, from Mont Lozére to Eaux-Boumes, Montagne noire, forest of Ezonmendi (GEOG. et Colleni). Sierra de Burgos (WILL. and LANG.). Bonsia (CONRAD BROW). Transylvania (SCHUM., LAMBINEL, and ACHESON HEYWOOD).

THE Pyrenean Lily is one of the commonest, but at the same time one of the best-ornamental species that we have; and so, moreover, its smell is rank and disagreeable, it may give place in gardens to many newer and more beautiful species. It has probably been known to botanists and gardeners for centuries, but was not distinguished from L. paeoniflorum until Fournier Gouan, of Montpelier, in 1773 separated it from that species, and figured it in his 'Illustrations.'

It appears to be confined to the Pyrenees, on both sides of which range it is found not uncommonly at from 1000 to 5000 feet elevation. WILLKOMM and LANG. in their 'Prodromus Florae Hispanicae,' include L. paeoniflorum as found in the Sierra de Burgos; but I think it must be more probably L. pyrenaicum.

Mr. Maw also informs me that he has found it apparently wild in North Devonshire, where it grows abundantly on an old hedge-bank between South Molton and Nellond; but taking into consideration that it is a plant of very limited distribution, I cannot regard it in this instance as more than an escape from some garden.

The plant from which my figure was taken was collected by Mr. Maw at Tolosa in the Pyrenees, at about 1800 feet elevation. It flowered in Mr. Wilson's collection at Heatherbank early in June 1875.

The dull-red variety of L. pyrenaicum which is sometimes seen in gardens is of doubtful origin. I am not aware that it has ever been found in a wild state with red flowers. It may be descended from the real paeoniflorum and changed by long cultivation; but as seen at present it certainly comes much nearer to the Pyrenean plant in every thing but colour.
Other slight varieties are in cultivation; but I have not seen any worthy of notice or of being distinguished except one which was flowering at M. van Houtte’s in 1870. I do not see it in his recent catalogues; but it certainly appeared to have much handsomer flowers than usual.

The cultivation of this species is of the simplest. If planted in some half-shady corner of the garden and left alone, it will thrive well and perhaps be more appreciated than if placed in a prominent position. It is easily increased, if desired, by seeds or offsets.

An unspotted variety is figured in Parkinson’s ‘Theatrum,’ No. 35, as “Martagon luteum non punctatum;” but this I have not seen in cultivation at the present time.

P.S.—Since the above account was in type I have flowered the lily spoken of as sent by Conard Blower from Besançon. It proves to be identical in all respects with L. pyreneeus. The lily collected in 1873 as L. atropurpureum by Herr Liechtenstein, at Veroapatok in Transylvania, which has grown one season in my garden but has not flowered, also appears to be very similar, but, according to Herr Liechtenstein, is more floriferous and sweet-scented. Mr. Max also received the plant from Archibald Reynolds, of Knaresborough in Yorkshire, and sent me the flowers for comparison; but I could see no difference between them and the type. Whether this is the L. atropurpureum of Grisebach (Pl. D. A. 285) is doubtful; but, according to his description, it has broader leaves, and may be more properly referred, as it has been by Mr. Buxton, to L. chelidonium. The geographical distribution of the species, however, is very curious, as it is found neither in the Western Alps, where it is replaced by L. martagon and L. pyreneeus, nor in the eastern mountains of Styria and Carniola, where L. chelidonium is found. It reappears again only in Transylvania, Albania, and Bosnia, at least a thousand miles from the Pyrenees. Judging from analogy, it is possible that Balman’s L. pyreneeus, a dried specimen of which from the mountains of Lusitanian I have seen in the Paris herbarium, may really be the European species, and not, as one would at first suppose, a variety of the Caucasian L. monadelphum.
LILIJUM TESTACEUM.

THE NANEEN LILY.


Nandum in parte totius cogniti, verum nimirum L. candidum et L. chaleianum hybridum.

Bulbus perennialis, largus, globosus, whitish. Stem 4-6 feet high, slender towards the top, but stout below, slightly ribbed, subglabrous. Leaves scattered, 68-169 in number, closely set on the lower part of the stem, but more scattered above, erecto-patentibus, linear, 3-4 inches long, 3-4 inches broad at the middle, narrowed gradually to the base and point, 3-5-nerved, the edge and midrib minutely distinctly ciliatus, the upper leaves gradually smaller. Flowers 3-10 in an umbel or thyrsoid cyme. Pedicels 4-6 inches long, cernems at the end. Perianthum niveum, 23-3 inches deep, the lowest quarter of the divisions condensed, above this reflexed, 1-1 inch broad at the middle, deeper in colour and slightly papillos towards the throat, sometimes with a few reddish spots. Ovary 6-9 lines long, style 12-15 lines, flowers 16-18 lines, anthers 1/2 an inch long; pollen vermilion.

This distinct and handsome Lily first appeared in Europe about the year 1836; and though its origin is lost in obscurity, there is every reason to suppose that it is a hybrid between Lilium chaleianum and the common White Lily. It has been supposed to come from Japan; but as no traveller has seen it there, and among the millions of bulbs imported to Europe during the last ten years not one has arrived, it is hardly possible that the plant can exist there. If additional proof is needed I have it in the fact that no such plant is represented among the collections of Japanese drawings I have seen, though they include many, and many as yet unknown, garden forms.

The history of the plant is given at some length by M. Van Houwen, in the ' Fove des Serres; vol. i, from which it appears that it was first seen by M. Halcar, jun., of Erfurt, who found it among a number of Marganteus which he had received from Holland. It appears, however, that these amateurs of Lile also possessed this Lily, and, believing themselves to have the only ones, nursed them up with great care. M. Van Houwen of Ghent, happening to see one of these plants, was struck with its beauty; so that when a short time afterwards he received the offer of a quantity of Naneen-coloured Lilies from M. Wagenheimen, he did not hesitate to accept them, and became the happy possessor of a large quantity. As usual, it was sent to England, and flowered for the first time at Masters, Rollinson's in 1842, when it was described and named by Dr. Lindsey, whose name, being the first published, takes precedence over the others, L. exilidam and L. isabelio, by which it is sometimes called.

I have endeavored to obtain seed from this plant, to see whether it would reproduce its characters without variation; but as far as I can learn it never forms seed naturally. Mr. Trenman, of Tregoney, Cornwall, however, has succeeded in fertilizing it with the pollen of one of its supposed parents, and has raised young plants from the cross, the flowering of which I await with much interest.

The Naneen Lily grows, in good soil, from 5 to 6 feet high, and produces such a head of flowers as is represented in the Plate. This was drawn from one which flowered in my garden in July 1873. I have never seen more than twelve flowers, four or five being a much more common number. Like most of the
Martagon group it prefers loam to peat soil, and resists the hardest frosts with impunity. It flowers about the beginning of July, at the same time as the White Lily, and about fifteen days sooner than the Scarlet Martagon. The bulbs are very large; but as there is nothing remarkable about their formation, I have not thought it necessary to figure one.

I have recently learnt from my friend Major Trevor Clarke, of Welles Place, one of our most experienced and scientific horticulturists, that he has produced a lily hardly distinguishable from the ordinary testaceum, by fertilizing L. chalconeum with the pollen of L. candidum; as, however, he raised plants in the same year from seed produced by L. testaceum, there is just a possibility of their having become confused, though he has little doubt of the correctness of his statement.
LILIIUM DAVIDI.

DAVID’S LILY.

L. Davidii, Duthie, MS.


Red: Tibet orientalis, territorie “Manc” dicte, alt. 9000 ped.

Capsulae ignotae. Stem erect, slender, terete, green spotted with purplish, about 2½ feet high, slightly marked with prominent ridges, as in L. cornus, and covered with pale green hairs. Leaves 6½-7½, crowded towards the centre of the stem, becoming shorter and more scattered at the extremities, linear, 4½-5 inches long, 1½-2½ broad, somewhat, hardly narrowed at the base, having the edges resolute, and a single prominent central nerve beneath, covered with short hairs. Pedicels ½-3½ inches long, with lanceolate bract at the base, but not beaked, very spreading, slightly cutaneous at upper end. Flowers, in the only known specimen, three, in colour apparently an orange, with numerous purplish spots on their lower half. Perianthi-segmenta 15-16 lines long, 3-4 broad, oblong, shortly campanulate at the base, very spreading at the points, but not resolute, marked with prominent papille at their base, and remarkable from the presence on the outer side of a medium band, covered with long white hairs: the bands are wider on the outer than on the inner segments, and form, in their junction at the base of the perianth, a downy collar. Filamenta 1 inch long, regularly suberect, with ligulate anthers ½ line long; pollen yellow. Ovary green, 9-10 lines long, style twice as long as the ovary, bearing a few cutaneous hairs. Capsule unknown.

The new species of Lily which is here represented was discovered by the Abbé Armand David in the month of June 1866, in the country of the Mancs, district of Youtcho, a region on the borders of Tibet and China, in about lat. 31° N., long. 101° E. This enthusiastic missionary, whose travels in the interior of China have added more to our knowledge of the fauna and flora of that country than those of all other naturalists together, with the one exception of Mr. Swinhoe, on returning from the second and most important of his journeys, brought with him, among a large number of new and rare plants, birds, and mammals, a single dried specimen of the Lily which now bears his name. His collections, which were deposited at the Herbarium of the Jardin des Plantes, are still unarranged and undescribed; but, owing to his kindness and that of Professor de Châtrix, I was enabled to go over all his Lilies, and was fortunate enough to find several the existence of which in China was previously unknown. M. de Châtrix pointed out to me the peculiarities of the species under notice, which he was at first unwilling to describe from a single and not very perfect specimen. As, however, a careful examination shows that it can hardly be mistaken for or united with any other species, I requested him to do so, and to name it after its discoverer. A careful drawing of the plant was made by M. Faquet, and has been faithfully lithographed by Mr. Fitch; so that, though the colour of the living flower may be brighter than the figure, the latter is in other respects an exact representation.

I should not have departed from my promised course of figuring from living plants only, had there been the least hope of getting other specimens or bulbs of this plant; but as its native country has never been visited by any European, except the Abbé David, and is, from its inaccessibility and the hostility of its inhabitants, likely to remain for many years a terra incognita, there is but little hope of the plant being procured again. The Abbé David informs me that the mountains of this district are of great elevation, reaching 15,000 feet or even more. The flora as well as the fauna bears a strong resemblance to that of the Eastern Himalayans—Rhododendrons, Magnolias, Mahorias, Bambous, Pines, and Oaks being some of the most prevalent types of vegetation at different elevations. Nearly all the most characteristic Himalayan genera are represented; and, indeed, there are few plants belonging to non-Himalayan genera, though many of the species differ. Liliopsis giganteum and L. pelophyllum, both of which are Himalayan plants, were included in M. David’s herbarium, and prove that the climate and soil must be of a very similar nature to those of many parts of Nepal.
LILIUM POLYPHYLLUM.

THE MANY-LEAVED LILY.


$L. stylosum$, Klotzsch, in Herb. Bred.


Hab. Regis temporece Himalaya occidentali, alt. 6000-8000 ped. (Bolle; Jacquemont).

Bulbs long and much narrower in proportion than usual, composed of a few thick compressed scales sharply pointed at the top. Roots very thin, fibrous, and wrinkled. Stems 2-4 feet high; glabrous, terete. Leaves many, ensheathed, or sometimes sheathed below, lance-lanceolate, 4-5 inches long, 6-9 lines broad, similar in structure to those of $L. nanum$, with fine anastomosing veins. Flowers 4-10 in a leafy raceme. Pedicels 2-4 inches long, accumbent by a pair of large bracts. Pedanthemis 18-21 lines long, yellowish, with purplish spots, refuse from the middle. Ovary 8-7 lines long, style 10-11, much curved; filaments 15-18 lines. Capsule 12-16 lines long, rather obtusely angled, with a distinct neck.

This rare Lily, the only one of the Martagon group yet found in the Himalayas, is very little known at present. Discovered forty years ago by Mr. Royal, at Tertaoud, in the province of Kumaun, it has since been gathered by several travellers in the western parts of the mountains; and though it has not been noticed in Nepal, I have reason to suppose that it occurs in Sikkim, and even further east, on the frontiers of China and Tibet, where a plant which I believe to be identical was collected by the Abbé David in 1849.

Of its native haunts we know but little, though a correspondent of Mr. Baker at Mussoorie, quoted in 'The Garden,' Jan. 21, 1874, says:—“It grows in good, tolerably moist vegetable mould, on a slope, in thick shrubbery, and flowers here in June, at an elevation of 6000 feet.”

It seems to have been first introduced to the Edinburgh Botanic Gardens, where it was raised, according to Mr. McNab, the Curator, from seed sent from Sikkim. I saw it here in fruit in October 1873, under the name of $P. polyphyllum$, and raised some of the seeds given to me by Mr. McNab, which enabled me to observe two curious facts respecting this species:—first, that the germination is, in some cases at least, subterraneous—that is to say, that the cotyledon does not appear above ground; but, as in the case of $L. nanum$, the first sign of growth is a true leaf, the thickened base of whose petiole forms a minute scale; secondly, that the shape of the bulb may be distinguished in its earliest stage, so that a one-year seedling of $L. polypphyllum$ cannot be mistaken for any other species whose development from seed I have watched.

For the specimen here figured I am indebted to Mr. G. Maw, of Borthall, who was, I believe, the first person to flower the plant in England, and for the drawings of the bulb and capsule to Herr Max Leichl.ian.

Though a few bulbs have been recently procured from India by Mr. Baker and others, and are believed to be perfectly hardy in this country, the plant is still very rare, and the seedlings which I have raised, though now three years old, make but slow progress.

Mr. McNab informs me that he has received from California a Lily apparently undistinguishable from $L. polypphyllum$; and a bulb which he sent me certainly bears out his statement. But the fact of a plant found only in the Himalayas reappearing in California is so extraordinary, that I am forced to believe, in the absence of corroborative evidence, that a change of labels, or one of those mistakes which are so difficult to avoid in large gardens, is the real foundation for this statement.

The photograph accompanying this Part is by Messrs. Bourne and Shepherd, of Calcutta, and represents a scene in the Wanga valley of the North-west Himalaya, at about the elevation where $L. polypphyllum$ is found.
Lilium speciosum
LILIUM GIGANTEUM.


Bulbus globosus excepto perecenti 5-6 poll. crassus, squamosus et subpapillatus. Culmis 6-12 pollatis teres glaber viridis basi 14-3 poll. crassus. Folia primordiis viridis, caulina 12-20, ad basin eiliis producundae, sparsa ovata acuta obae profunde consata, saturo viridis, recti-rotate-emassa, inferiorem 12-18 poll longa et lata, petalis erecto-petulatis mandicellis 9-12 poll longis, superius scariosus subaequatus petalis brevissimis. Racemo 6-12 floriis, 1-3 equalibus, capsaque ad pedales latiusculos attingens. Brutae varietates magnum eamque adeo decades. Pedicelli 3-12 lin. longi, primam subaequato, fructifici ascendentes. Pericarpi inaequilaterum mesocolon 5-6 poll longum album, latum purpureum, extus viridi tintunum, tabe e basi 6-7 lin. crassa ad cellum 18-21 lin. interna seminum angustatis, segmentis oblongocostatis ad basin quattuordecim et 9-12 lin latis, ad basin seminum angustatis, interiobus latiuscolis. Stamina perianthio tricolore breviora, filamentos desomum umbraceum sub erectis 3-12 poll longis, antheris flavis 3-4 lin longis, polline late. Ovarium cylindricum 1 poll longum, stilo six decem saepe vel subduplo brevior. Capsula late oblonga 2-3 poll longa obtusum apice umbilicata, esto magno turgente.


Bulb very large, attaining a diameter of at least 4 inches before flowering, composed of the thickened bases of the petals, in which it differs from all other Lilies except ecorfolium. After the leaf has withdrawn down to the base of the petal, the scale, which has by this time become very thick and fleshy, spins slightly to give place to the new leaves, which are thrown up from the crown of the bulb in early spring. Between the old scales and the new growth 3 or 4 short green leaves are annually produced, which disappear as the stem elongates. Leaves, except the uppermost, distinctly stalked, with broad petals a foot long, clasping the stem at the base; the blade broad, cordate-sawed, a foot or even more long, acute or acuminate. The upper surface bright shining green, beneath paler and duller, strongly veined and reflexed. Until the flower-stem is produced, which does not take place for several years, these are the only leaves formed by the plant, which differs remarkably in the appearance of both leaves and leaves from any other species except ecorfolium. The hollow flower-stem is of great thickness, 5 to 8 inches in circumference at the base, and is clothed with similar leaves, gradually becoming smaller and closer towards the summit, till these just below the leaves are only 3 or 4 inches long, without broad leaves, and with a broadly winged petiole about an inch long. Flowers from 4 up to 20 or more in a raceme, 1 to 2 feet long, the upper ones inclined upwards, the lower horizontal or slightly drooping. Pedicelli 3-12 lines long, very stout, turning upwards after fructification has taken place. Beards eete semisessiles; 2-5 inches long, falling when the flower expands. Perianth funnel-shaped, 5-6 inches long, white, tinged with green outside and purple at the throat, acute, and 5 or 6 inches round when fully expanded, divisions spreading only at the top; segments oblongolate, bisthrik, the outer ones 9-12 lines, the inner 12-15 lines broad, narrowed gradually to the base; claw not at all hairy or papillose. Ovary chavate, 12-15 lines long; style straight, 1-2 inches long; filaments 3-5 lines long; anthers linear; pollen yellow; capsule obvoid, 2-3 inches long, bladdery angular. The numerous valves 13-15 lines broad. Seeds triangular, flat, with a broad membranous wing.

The Lily which is here described, though not perhaps the most beautiful of its genus, is certainly the largest, and well deserves the name of giganteum given to it by Wallisich.

It was first discovered about the year 1825 by that botanist, during the time of his residence at Kathmandu, the Court of Nepal, where he was fortunate enough to be sent with the Government Mission which proceeded to Nepal after the close of the war with that State. He described and figured it in his "Tenement Flore Nepalese," with many other magnificent plants discovered at the same time.

It has since been observed by many travellers in various parts of the Himalaya Mountains, ranging from Kumaun to Sikim, and doubtless extends even further east in the unexplored mountains of Bhutan. I hear from the Rev. Davis that he found it in the independent state called Manza, lying between Tibet and China, about lat. N. 21°, long. E. 161°. It inhabits the temperate region from 5600 to 10,600 feet elevation, growing among shrubs and on the borders of woods in a rich light soil. It was also found by Dr. Hooker at Kalapan, at an elevation of 3300 feet in the Kasin hills of Assam, where it is called "Kalang tatti" by the natives.
In 1879, during my journey in the almost unknown mountains of Sikkim to the frontiers of Tibet, I saw this noble plant growing abundantly in the Lauchen Valley, at about 8000-9000 feet elevation. Here it flourishes, in a climate which may best be described by saying that for many weeks it was impossible to dry thoroughly our tents, clothes, or bedding; the rainfall, though by no means equal to that of the Khasia hills, or even the lower valleys of Sikkim, is almost continuous from April to October; and though the mornings are often bright and sunny, a dry afternoon or night is rare. In this moist though not unseasonal climate the vegetation is of the richest and most varied description. Nearly all the most beautiful genera of the north temperate zone throughout the world are here represented by one or more species; and in addition to these, many plants belonging to the tropical Malayan flora are abundant.

Dr. Hooker, the only botanist, and indeed almost the only European, who has visited this wonderful valley, mentions amongst the plants which he observed. (vide 'Himalayan Journals', vol. ii. p. 30) — Of N.-American genera, Buddleia, Psychotria, Maypopa, Scouleria, Hydrangea, Dicentra, Aralia, Paeonia, Symphoricarpos, Trillium, and Cushania. Of Japanese and Chinese genera, Cornus, Deutzia, Aconitum, Scutellaria, Hydrangea, Sophora, Erythroxylon, Eupatorium. Of Malayan, he found many Rhododendron and Varrania, Kaempferia, Gouania, Malacca, Ceylonese, Callicarpa, Rhamnus, and several Scitamineous plants. Besides these were splendid representatives of many well-known European genera, as Canellaria, Gentiana, Spiraea, Polyanthus, Pyrethrum, Rosa, Aconitum, Cattanector, Lavatera, Frutillaria, Primula. The Gigantic Lily towers in all its glory above most of the other herbaceous plants, scenting the air for yards around with its sweet perfume, in the month of July, and lying buried under the snow from December to March, when it again begins to push forth leaves.

Though so long known to botanists, this plant was not introduced into Europe till 1847, when Col. Maule sent seeds to the Botanic Gardens, Glasnevin, Dublin, which were successfully raised and liberally distributed. It had previously been sent over several times, but, owing to the long time it takes to germinate, had probably been thrown away as bad. The plant first flowered at the Console-Bank Nurseries, Edinburgh, where Mr. Cunningham raised it from seed. From one of his plants it was figured and published in the 'Botanical Magazine' of 1851.

Since then it has become well known, and, having been found perfectly hardy in most parts of England, is to be seen in the gardens of all who can appreciate a really fine plant. Among the places where it is established in great perfection, I may mention the gardens of the Duke of Richmond, at Gordon Castle in Banffshire, and of the Earl of Waldegrave, at Merrow in Norfolk, where, the Rev. Harpur Cawse informs me, it is planted on both sides of a half-shady avenue, and ripens seed abundantly every year.

The tendency to grow very early in the spring, which is shown by this as by the majority of Himalayan plants and trees, makes it advisable in exposed or cold situations to protect the leaves from being cut off by late frosts; and if the summer is dry, copious waterings and syringings will be found very advantageous to it. The offsets, which are freely produced on the old bulbs, should be separated as soon as they are large enough, and planted separately, as they prevent the large bulbs from flowering so strongly if allowed to draw away their vigour. This Lily may also be successfully cultivated in a large pot, though its great size renders it less desirable than many species for this purpose. The seed, which is freely produced in autumn, should be sown, as soon as it is ripe, in pots of light soil, and will germinate in the following spring, though it kept long it may lie for one or two years before coming up. The accompanying drawing was made from a plant which flowered in my greenhouse in the end of May 1873, and was selected for figuring on account of its moderate development. A full-sized plant would require a much larger place to do justice to its dimensions.

The development of this plant from the seed has been most carefully studied and described by Professor P. DeCandolle, of Paris, in an elaborate paper published in the Journal of the Central Horticultural Society of France, 1874, pp. 544-591. By his kind permission I have reproduced the drawings by which this paper is illustrated, and will publish them with full details at the end of my work.

* I found it in the upper part of the Kullung Valley, in March 1878, in a very dark swampy place, at about 8000 feet elevation, in full leaf; but in this very shady situation it was not so robust or vigorous as in Europe or on the higher and colder ranges of the Laochen-Lachung district.

† I am indebted by the Hon. and Rev. V. Rucaner to that he forwarded the plant either in 1853 or 1854, and this handsome drawing which he sent me of it shows how well the damp and mild climate of Cornwall suits its requirements.
LILium PHILADELPHICUM.

THE PHILADELPHIA LILY.


Hab. America borealis orientalis ab Canada ad Louisiana.


Bulbus fonsit annulatus ad unum; non tamen strelophorus, ad mundum charum thick, edificis, with thick scales & an inch long, tapering to the base, where they are loosely attached. Stem 1-3 feet high, rigid, slender, quite glabrous; the lower third without leaves. Leaves in the typical form in four or five regular wheels of six or eight each, spreading, narrowly obovate, 2-4 inches long, 3-6 inches broad at the middle, narrowed gradually to the base and to the acute point, thinner in texture than usual in the genus, indistinctly marked below with 3-5 nerves, quite glabrous. Flowers, in wild specimens, one or two, in cultivation sometimes more, erect. Pedicels ascending, arachnate or straight, 2-3 inches long, naked, or with a single linear bracteole. Perianth 2-3 inches deep, about 2 inches across at the mouth when open; the divisions only palate at the tip, bright orange-red, spotted with purple in the lower half, not papillosa, 6-10 lines broad at the middle, narrowed suddenly above the base into a claw with revolute edges. Filaments 1-2 inches long, anthers 5-6 lines long; pollen red. Ovary 9-10 lines long; style 15-18 lines long. Capsule oblong, with acuminate angles.

This distinct and striking Lily, though not so robust as many of its American congers, is worthy of more general cultivation, and when better known than at present is sure to be appreciated. It is a common plant in many parts of the United States, from Canada to Louisiana, and was sent over by Bartram as long ago as 1754 to that prince of 18th-century gardeners, Philip Miller, then curator of the Chelsea Botanic Gardens, in whose Illustrations a figure of it will be found. In the State of Vermont, as I learn from my friend Mr. Paine, it grows in open woods of oak, pine, and poplar, where the soil is sandy and the sun not entirely excluded. It is accompanied by many pretty plants, such as Hepatica trilobata, Polygonum pumilum, Gnaphalium prevulce, Chamaeliria umbellata, Pyrola rotundifolia, Epipactis repens, and Spiranthus graciosus. In its natural state it bears one flower only, but in cultivation often produces two, three, or even more. The variety called ussismis by Nutall, which is found in the Southern States, bears as many as five or six, and is also distinguished by the leaves being scattered along the stem rather than in whorls. These peculiarities may be only caused by a finer soil and climate; and as this variety is not yet in cultivation, I cannot at present say how far they are permanent. There is, however, a fine variety sent by Miss. Hanson, of New York, from Warren county, Wisconsin, which, in its native state, varies extremely in colour, hardly three plants being alike. It ranges from yellow to deep Indian red, beautifully spotted, and has the leaves narrower and more scattered than the common variety.

Mr. Hanson, to whom I am indebted for these particulars, tells me that this Lily is found in all the middle and eastern States, often on railway-embankments or in woods where there are open glades and the soil is dry and loose.

In cultivation I have found that it is more indifferent to drought than most of the other species, and will thrive in a hot sunny place; whereas if planted in peat soil with cannanthus, superbus, &c., it dwindles
and dies. I have, however, cultivated it in pots in peat soil with great success, and have obtained good seed from it by keeping the pots rather dry in a warm greenhouse. The seed germinates readily, and grows more quickly than usual; and as I am rather doubtful whether the bulbs can be increased freely by means of offsets, I think this will be the best means of propagating the plant.

The growth of the bulb in this species is peculiar, and unlike that of any other lily, though it has some analogy with *L. meconon*. It is a curious fact that all the American lilies, though varying remarkably among themselves, differ entirely in their bulb-structure from those of Europe and Asia; and the same peculiarity is noticeable among the American frillaries, which, as far as I know them, have bulbs composed of small white scales loosely attached to a solid central axis, from which the stamens spring. Of all the Old-World lilies and frillaries only two, namely *Lilium meconon* and *Fritillaria kauzeiokemns*, resemble their American congeners in the formation of their bulbs; and both of these are restricted in their geographical limits to the shores of North-eastern Asia, which have many affinities, both botanical and zoological, with the Pacific coast of North America.
LILIJUM DAVURICUM.

THE SIBERIAN LILY.


*L. spectabile*, Link, Hau. i. 531; Reich, in EAST. t. 50; Fisch. & Mey. Bot. Sem. vi. 58; Regel, Gartenflora, t. 549, et 1872, t. 251.


*Hed. Siberica orientalis*. Sibalicum. Japonica borealis (Maximowicz). Bulbi minoris, fragili et delicato in structura quam alii de *L. croceum* et *L. bulbiferum*, componee de borealis nem constringente chloraceae sese, quae in ea quae distincte articulatae in medio, quae in fig. 5 de Plano. Stamen majori que alii in alii speciebus, generaliter crepitant subterraneo et sehabebulbux in ceteris punctis, quae in fig. 12, more or less strongly dilated, very slightly pubescent, without anther half. Leaves scattered, 4-6 inches long, 2-4 line broad. Flowers usually solitary, rarely, if ever, more than two or three in cultivation, but sometimes, according to Professor Maximowicz, in wild specimen from Manchuria as many as eight, though much more usually one or two. The segments rather narrower than those of *L. croceum* and *L. bulbiferum*, less strongly banded. Filaments, anthers, style, and stigma not materially different from those of *L. elegans*. Capsule said to differ in having a perfectly flat top, whilst that of *L. bulbiferum* and *L. croceum* is oblunctate.

THE greatest difficulty has been experienced by myself, as well as by others, in separating this plant specifically from its nearest congeneres.

The characters which it has in common with *L. elegans*, *L. croceum*, and *L. bulbiferum* are so numerous, and the points in which it differs are either so doubtful or so obscure, that I should prefer to consider it a subspecies or geographical variety. As, however, it would be impossible to say to which of the three species above named it is most nearly allied, and its geographical range covers the habitat of one of them, it would perhaps be better to treat it as a species; whilst those whose views on the subject of specific distinction are wider may group it, as was done by Mr. Baker in his first revision of the genus, with *L. elegans*, *L. croceum*, and *L. bulbiferum*, under one head.

The history of this plant is curious. Though a native of the eastern parts of Siberia, it was first described and figured by Catesby, who, seeing it in the gardens of Mr. Collinson in London, in 1745, supposed it to be an American species, probably *L. philadelphia*. GAUWER, following Catesby, figured it in the Bot. Mag. for 1805, t. 872, as *L. penangense*, stating that the bulbs had been imported from America. Afterwards, however, he becomes fainter that he was in error; and under the description of *L. convolvulus*, B. M. n. 1165, tells us that, on inquiring further about the origin of the plant which he figured, it might very likely have come from Russia. Further on, under fig. 1210, he says that, having seen specimens collected by Pallas in Siberia, in Mr. Lambrey's herbarium, he is no longer doubtful of the native country of the plant, and names it *L. davuricum*, which should more properly be written *L. davuricum*. Pallas, Gmelin, and other Russian botanists had gathered the plant, but had not distinguished it, though later on Link, overlooking the excellent plate in the Bot. Mag., called it *L. spectabile*.

It is a curious fact that this very same plant still goes in the Dutch nurseries by the name of *L. Catesbai*, the true species of that name being unknown there.
In a long and philosophical discussion on the influence of foreign pollen on fruit, copied from the Journal of the Roy. Hort. Soc. into the 'Garden,' Feb. 1, 1878, p. 86, Prof. Maximowicz describes very clearly the peculiar formation of the bulb of this species. He then describes his experiments in fertilizing L. densus with its own pollen and crossing it with L. bulbiferum, and tells us that the effect of this cross was to produce on L. densus a capsule closely resembling that of L. bulbiferum; whilst L. bulbiferum fertilized with the pollen of L. densus produced the capsule of the male parent.

Now this fact, if it could be really verified, would be a most remarkable one; but it is so contrary to the experience of many persons who have attempted to hybridize Lilies (see under L. Parkannum), that I cannot help supposing that there must be some error in the statement.

From what I have seen myself, I believe that very much dependence cannot be placed on the form or size of lily-capsules produced in cultivation. It often happens that complete fertilization does not take place, and more often that the vigour of the plant is not sufficient to enable it to mature or even swell the whole of the capsule, in which case its shape is very different from what it should be. Whether the difference between the capsules of these plants in a wild state is really constant I am unable to decide, from the absence of nature specimens, as I have never seen or been able to procure a perfect capsule of bulbiferum, and the only supposed one existing in the New Herbarium, being from CORSICA, is more likely to belong to L. croceum. The capsules of L. elegans, which I have seen, differ conspicuously in having the spicula.

I was at one time inclined to believe that the plant shown in fig. 9, which is undoubtedly GAWLER'S L. densus, was different from the one described by Dr. ROGERS, as the articulation of the bulb-scales (side fig. 5), which both he and Prof. Maximowicz regard as one of the distinctive characters in their Siberian plant, is, as far as my experience goes, not visible in the old cultivated strain, which has, moreover, a creeping habit (side fig. 2). Long cultivation may have had the effect of causing this difference, though it does not seem to have improved the size or solidity of the bulb, which is always fragile and delicate; but there is no difference whatever in the stems or flowers of the two varieties.

GAWLER writes of it in 1889, "It has now been cultivated in our gardens for at least sixty years, during which time it has maintained its appearance and habits. It is very shy of flowering, never produces more than two flowers, and rarely more than one; hardly ever a perfect plait, but a profusion of offsets, which never arrive at a greater size than that of a small walnut; the stem is always lax and feeble, having to us the appearance of having been drawn up in a hot-bed."

The Siberian lily extends from the mountains of Dauria, about 160° E. through Manchuria and the region of the Amoor, to the islands of Sakhalin and Yesso, where it has been found by Prof. Maximowicz and others.

I am indebted to Mr. BULL for the plant shown in fig. 1, which was received by him from St. Petersburg.
LILIUM CROCEUM.

THE ORANGE LILY.


L. Croceum, S. T. Moggridge, M.S.


L. croceum, Parkinson, Par. 57, t. 3.


Hab. Helvetia; Gallia; Italia borealis. In herba sub forma plurimis in cultum, ad inimicum Julii post bulboferum florescens.

Bulbus large, glososus, white, sometimes stoloniferous when young or in a wild state. Stem tall, stout, ribbed, seldom or never bulbiferous. Leaves many, scattered, lanceolate. Flowers in an umbel-like those of bulbiferum, from which this plant is doubtfully distinct. Perianth-segments orange, never scarlet or crimson, very much narrowed at their base, and slightly woolly outside. Capsule said to be more axially angulated, and seed with a broader wing, than in L. bulbiferum; but these points of distinction I cannot personally verify.

Hab. Subalpine region of Dauphine; neighborhood of Grenoble; forest of La Grenette, near Gap; Signet (Grenoble) Subalpine Highlands. Maritime Alps (Mau); woods above Bastia, Corsica (Mau); above Pontresina, Switzerland (Mau). Between Etruscan and the Vaucluse valleys (Warren). Hills of Tuscany.

THE variety of the Orange Lily which I have here figured is a plant indigenous to Northern Italy, and has been considered by some a distinct species; but as I am very doubtful whether any good and constant character exists by which L. croceum itself may be distinguished, I cannot allow Chaix’s plant specific rank. The species is found in the south of France, Corsica, and Subalpine Switzerland, sparingly in the Pyrenees, and in Scandinavia; but the variety Chaixi, as far as I know, only occurs in the Maritime Alps, where it was noticed by Ms. Menghini near St. Dalmazzo di Tenda. Mr. G. Mau, who first introduced and flowered it in England, and whom I have to thank for the fine plant figured, looked on it as a distinct plant, and expressed its peculiarities as follows:—

1. Croceum or Chaixi, from Maritime Alps. A dwarf plant 15-18 inches high, generally with one solitary flower, and never more than three; flowers a month before the type; colour bright chrome-yellow; petals broader; perianth fugitive and deciduous.

2. Croceum of Corsica. A tall plant, 2½-3½ feet high; late-flowering; never bulbiferous; flowers dull orange, arranged in whorls, from ten to fifteen on a stem. This is the Orange Lily of English gardens, and is a larger plant than that found in the subalpine districts of the Continent.

As a proof of how little importance can be attached to the height of a plant in its native habitat, I would point out that the one figured has already nearly doubled its normal stature; and though it is undoubtedly much earlier in flowering than the common L. croceum, yet I believe that the climate of
its own country influences its season of flowering long after it has been removed to a colder place. I have observed a curious fact about the bulbs of this Lily, in which it seems to differ from its allies, *L. bulbiferum* and *L. elegans*, and to agree to some extent with *L. dayanum*. It is, that the bulbs are very much inclined to give out long stolons, bearing small bulbs at various points of them, and throwing up the stem at some distance from the parent bulb. I have as yet been unable to discover how far cultivation influences this habit, which is common to many species of Lily; but in some it certainly seems to check it, whilst in others, as *L. dayanum*, the tendency remains unaltered for many years.

The common Orange Lily of gardens is so well known that I need say little of it. There are many so-called varieties in cultivation, of which some are possibly hybrids and others semi-annual varieties; the origin of most of them is lost in obscurity. The one called *undulation* or *aurantiacum* is one of the earliest and showiest, often bearing as many as 40 flowers on a single stem.

*L. creosorum transsylvanum* of Mr. Barra’s garden is a miniature form with much smaller flowers, and only about 2 feet high; whilst the common *creosorum* often attains 5 or 6 feet in good soil. The capsule of this species is easily distinguished from that of *L. elegans* by its umbilicate apex, and is said to be different from that of *L. bulbiferum*: but I have seen so much variation in the shape and size of capsules on plants of the same species, that I do not think any great importance can be attached to slight variations.
LILUM CARNIOLICUM.

THE CARNIOLIAN LILY.


Martagon pannonicus var. saxitum flore applanato, Parkl. Pamp. 55.


Hol. Carniola. Carinthia; Styria; Friuli (Churchill); Mt. Semoon (Platt.).

Bulb ovoid, pointed above, with compressed and pointed scales, white inside and turning to a brownish yellow on the outside, 1-2 inches in diameter. Stem 2-3 feet high, stout, erect, glabrous. Leaves 30-40, scattered, ascending, lanceolate, glabrous; below 2-3 inches long, 6-5 lines broad, narrowed gradually to a point; on their upper surface glabrous, but distinctly ciliate on the veins below; the leaves smaller above, more scattered and pointed. Flowers 1-4, drooping. Pedicels 2-3 inches long, stout, sometimes bracteate. Perianthium 11-2 inches long, deep orange-red or scarlet, minutely spotted in the throat with red-brown dots; the segments oblong-ovate, 5-6 lines wide, very much revolute from two thirds the way down, deeply grooved and keeled on the lower third, slightly papillos in the throat. Style 5-6 lines long, about equal to the ovary, stout, yellowish. Filaments 8-14 lines long, generally much exceeding the style; anthers 3-4 lines long; pollen brick-red.

THE Carniolian Lily, or smaller Scarlet Martagon, is a species very restricted in its geographical range, and, though cultivated by Parkinson two centuries ago, was not to be found in a living state in England until two or three years back, when it was introduced abundantly—I believe, through the agency of Messrs. Haage and Schwabe, of Erfurt.

It resembles the Scarlet Martagon more than any other species, but may always be distinguished by its leaves, which are much shorter, more spoon-shaped, distinctly ciliated on the nerves of their lower surface. It is also a smaller plant, and, as a rule, much less brightly coloured than *L. chalcedonicum*.

In a wild state it rarely has more than one flower, though in cultivation I have seen as many as five or six; but even then it cannot be called a very pretty plant, in comparison with many others. From the red variety of *L. pyraninus* it may be distinguished by its smaller stature, and also by its much shorter and stouter style, which, indeed, appears to be one of its most distinctive features.

Mr. G. C. Churchill, the author of the ' Dolomiten Mountains,' whose knowledge of the flora of Central Europe is very minute, tells me that it is found at Biltingrana and Monte Caniglio in Carniola; at Neumarkt, on the south side of the Lobi Pus, the range dividing Carniola and Carinthia; in the mountains round Trieste; in the Val di Ferro, North-east Friuli, and on the Monte Semoon, north of Vienna. Mr. Churchill has not, however, found it in any part of Carinthia, the Tyrol, or Dalmatia, and doubts the fact of its being found in Styria, which is given as a locality by Koch.

In Weissen's 'Flora Norica Phanerogama' the following localities are given:—Monte Semoon, near the Zirkünzer See; near Raile in Carinthia; Monte Mariana (near Monte Piauris); Alp, near Lienz, Tyrol (doubtful); mountains round Idrija and Pirseval; and on Monte Nano, north of Adelburg.

It ranges from 1600 to 3000 feet elevation, occurring usually in pastures on a limestone formation, and grows finest in shady situations.
LILIM CANDIDUM.

THE WHITE LILY.

*L. Candidum*, Linn. Sp. 433; Buol. Mag. t. 278; Redouté, Liit. t. 199; Bory, Hæmat. t. 88; Reich. in Gern. t. 445, etc.

Bulbus ovatus perennis albidus vel flavescens. Folia primordiis biennis semilia abscissa, 5-7 poll. longa, 3-5 poll. lata. Caulis 3-5-pedalis strictus glaber, nigre-strictis. Folia 100 et pluris solum ascendentes viridia acuta 3-5-seriata margine minuto papillosa, centralis linearia, 5-6 poll. longa, lemnis oblongo-ovata obtusa, superius seminum măque, superna lanceolata 1-1.5 poll. longa, at caudam adpressa. Roseae hæris deliciosa 5-20-flora, expansa 6-8 poll. lata, foliis inflorescentis cuspidatis. Rosae lanceolatae vel lineares. Pedicelli ascendentibus, laevis 2-3 poll. longi, serice bracteatis. Perianthium albi latifolium late inflato-bifforme 2-3 poll. longum, e basi ad calycinum 1-1.5 poll. latum semeni amplius augmentis sericeo expanso trito superior superficie fimbriatus spor operculis angis medium 6-9 poll. max. 12 poll. lat. Stamina pellucida triente brevissimis; anteras latas, 5-6 poll. longas. Sepalus carnarios sanitatis valde superans, perianthio sub-apellus.

Hab. Europa meridionalis, Italia, Persicæ locis nemineus at Constantinopolis.

*Var. striaturn*, Florus des Serres, t. 725, est formas furbitas in purpureo-striatis.


Bulb white or yellowish, ovoïd; pointed towards the top, broad below. Primary leaves 6 or 8, sessile, oblong-elliptic, produced in autumn and enduring through the winter, 6-7 inches long, 1.5-2 inches broad. Stem 3-4 feet high, stiff, erect, dark green, 6-12 lines thick at base, quite glabrous like the rest of the plant. Leaves, 100 or more, crowded in the lower part of the stem, erect-petiolate, the lowest 6-8 inches long, 1-1.5 inch broad above the middle, 2-petioled, becoming narrower upwards; the uppermost lanceolate, about an inch long. Flowers 5 or 6 to 30 in a thyrsoid raceme. Pedicels rigidly sericeo-patent, the lower ones 2-3 inches long, naked or bracteate. Bases lanceolate or ovate, 6-12 lines long. Perianth pure white, sweet-scented, 2-3 inches long, the upper flowers more or less ascending, the lower ones drooping; divisions oblong-elliptic, outer 6-9 lines, inner 8-12 lines broad, two thirds of the way up, narrowed gradually to a cuneate base. Owary 9-9 lines long; style 1.5-2 inches, slightly ascending towards the point; filaments 13-15 lines long, pure white; anthers 5-6 lines long; pollen yellow.

*Var. striatum* is a form with flowers striped or tinged with purple on the outside, inferior in beauty to the type.

*Var. peregrinum* is a form long known in cultivation. It is distinguished from the type by its more slender habit, narrower leaves, smaller flowers, with the divisions narrower and more pointed, and a more distinct claw.

*Var. exulare*, Hort. Leichtlin., is a finer variety than the type, with broader, fuller, and more perfectly formed flowers, but, as I think, only the result of good cultivation.

**The White Lily** is of all lilies the one best known and most universally beloved. Except in a few gardens, where bedding-plants monopolize all the space, it may be seen everywhere, and in abundance. A bed of 200 or 300 white lilies, surrounded by a ring of that brilliant scarlet-flowered plant *Leiactis rodifolia*, forms one of the most striking and effective combinations I have ever seen; and though of course, like most lilies, its bloom is not of long duration, no one who loves flowers will deny its stately beauty.

Its culture is so easy and its constitution so good that it will grow in almost any soil or situation, a good deep loam being, however, the one most favourable to its development. There is a very beautiful variety, called aurea-marginata, which has the leaves, especially the primary ones, broadly bordered with yellow, and in winter is for this reason a very handsome object. It is at present somewhat scarce, the variety with blotched leaves often sold for it being very inferior in beauty.

The variety called *peregrinum* by Linnaeus, which is now seldom seen, was much grown on the Continent two centuries ago, under the name of *Sultana Zaubach*, and is said to have come from Constantinople. **Leonard Rauwolf**, a German botanist and traveller of the 18th century, met with it in Syria. It is considered
by M. de CANNART d'HAMAL a distinct species, and is said by Prof. D. Dus to have the style triangular near the apex; but after examining living plants, I think that Mr. Baker is quite right in placing it under the head of convallaria. There is also a double form in cultivation, which possesses none of the beauty of the single one, and is, like the striped form, a curiosity of no merit.

The White Lily seldom or never ripens seed in this country; and though it is said that by taking it up when in flower, and suspending it head downwards, it may be induced to do so, I have tried this method without success. Professor Duchartre informs me that he has obtained seed by artificial fertilization, and has raised young plants from it. The notes on the germination and development of this and other species, however, will be better understood, and more convenient for reference, if given separately at the end of the work; and this I hope to do in a more complete manner than would be at present possible.

The history of the White Lily must be sought for rather in such ancient authors as CLEMENS, PARKINSON, and Dallechamp, than in a work like the present, as it has been known in gardens from the earliest ages. In a charming little work on the history of Elises*, by my friend M. de CANNART d'HAMAL, President of the United Horticultural Societies of Belgium, will be found a long account of its history, illustrated by many quotations from ancient and modern authors.

It was undoubtedly grown by the ancients, and probably furnished the emblem of the fleur-de-lis borne on the standard of France for so many years, though some think that the design of the fleur-de-lis was taken from the yellow flag (trou pantaneaux).

It is said to be found wild in the Jura mountains, in the Pyrenees, in Corsica, Italy, and many other parts of the south of Europe; but having been so generally cultivated for centuries, it is doubtful in which, if any, of these localities it is truly indigenous.

Mr. Baker, however, gives its range as from Corsica, through Greece and Turkey, to Palestine, Northern Syria, and the Caucasus; and though I never saw it wild in Turkey or Asia Minor, it is mentioned in the Flora of almost every country of Southern Europe. LEREMOUC, in the "Flora Rossica," speaks of it as indigenous in Georgia, which seems more likely to be its native country than any part of Europe.

* "Monographie historique et littéraire des Lili. Malines, 1870."
LILIUM TENUIFOLIUM.

THE NARROW-LEAVED LILY.


L. penicillatum, DC. in Bol. Linn. i. 373; Kuntze, Enum. ir. 263; Bot. Reg. t. 152; Loud. Bot. Cab. t. 348.

L. Raffolium, Homemanc, Hort. Hafn. i. 326.


Balica paniculatrans sylvis compressissimse lavoleta. Ovatis 1-2-pedalis gracilissimae tergo glabris. Folis 20-40 angustissimis sparsissimis, centra, 1-4-5 pol. longis, 1-2.5 mm. lat. involucrarum. Pedunculis 2-3 pol. longis 1-2 mm. longis. Racemosis lanceolato-elliptis. Pedicelli 2-3 pol. longi, spirae cornibus linear-ellipticis glaucis. Perianthio 15-18 mm. longo, spiculo coccineo segmentis albo-lanatis, medio 5-6 mm. lat. valde revolutis facie apicem concavae, rami pedunculi porosae minute nigricantibus decoratis velutina globis distinctae impressae pellide. Filamenta pellide rubra, 8-9 mm. longa, anthorum dextro longiora, pollinis coccineo. Ovarium 3-4 im. longum, style gracilissime huevis. Capsulae breviter-digeros, 3-4-5 mm. longae, 5-6 mm. crassae spicis umbellatulis.

Hol. Siberia in montibus Alata ad Anurland et Chamn borealis (Pallas: Maxima; David). Japania! (Siebold).

Balls usually small and slender, but increasing under cultivation to the size shown on the plant figured. Stem 1-3 feet high, very slender, glaucous. Leaves numerous, ascending, linear-oblong, 1-2-3 inches long, 1-2 mm. broad, more or less crowded towards the middle of the stem, revolute. Peduncles ask for 2 or 3 inches below the flowers. Flowers in wild situations usually one, but in a specimen from Mentachoria fifteen, and in cultivation from two or three to twenty in a loose raceme. Pedicels 2-3 inches long, drooping at the end, with linear subulate bracts sometimes in pairs. Perianth 16-18 mm. long, bright shining scarlet, usually unspotted, but sometimes with a few minute black dots in the throat. Filamentum albo-coccineum, 5-6 mm. long, at the middle, spreading from a little above the base, having a rather distinct claw and a glaucous channel or necking, which commence about 4 mm. from the base. Filaments 8-9 mm. long. Anthers 5-6 mm. long. Pollen bright scarlet. Ovary 3-4-5 mm. long; style 5-6 mm. long. Capsules 3-4-5 inches long, 4-6 inches broad. Odour faint but agreeable.

The Narrow-leaved Siberian Lily is the smallest and most slender of all the Martagon group, though by no means the least ornamental. It has been known in this country for half a century, but has never become common—not, indeed, from any want of hardiness or difficulty of propagation, but because of the indifference to all plants of a similar class which has prevailed for so long. It is found in a wild state through the greater part of Northern Asia, from the Altai Mountains to Anurland and Northern China, where it has been gathered by Pallas, Maximowicz, David, and others. It was introduced to the St.-Petersburg Gardens in 1810, and from there distributed through Europe, being named and described almost simultaneously by Fischer, De Candolle, and Hornemann. It has been considered by some that the L. paniculatum of Reuten's great work is a different plant from the true L. tenuifolium; and De Reuten, in the 'Gartenflora,' 1865, p. 65-66, upholds this opinion. I think, however, that the plant which was called paniculatum by Reuten is undoubtedly tenuifolium, and that the figure in 'Gartenflora' represents the form of L. callosum found in Anurland, differing from the Japanese callosum in the less conspicuous cali of the upper leaves.

In its wild state in Siberia, the Narrow-leaved Lily does not usually have more than one or two flowers, though in Mentachoria it sometimes produces as many as fifteen, and by good cultivation it acquires sufficient strength to produce an even greater number. M. de CANNART D'HAMAL, of Mallins, informed me that in his garden he had seen as many as twenty-eight on one stem; but such plants are very rarely found; and it must be confessed that, as grown by most people, it is by no means so fine a plant as depicted in my Plate. This was drawn from a splendid specimen grown by Mr. Wilson, at Weebridge, which flowered in the end of May 1875.

To obtain such vigour as this, strong bulbs, which have been grown from seed, must be procured.

* Mr. Baker describes the leaves as having the edge revolute; but this is not the case in any of the living specimens I have examined.
and though it is not generally known or practised in England, the process is a very simple one. Fresh seed of *L. tenuifolium* will germinate very easily and quickly, and, if properly treated, produces flowering bulbs in three years.

At the fur-nished nursery of Mr. Louis Van Houette, at Ghent, I have seen a bed containing thousands of this Lily, all raised from seeds, which surpassed in health and vigour any of the same species I have noticed elsewhere.

It appears to grow best in a light and sandy though cool and moist soil, but is very apt to die after flowering strongly. I am, indeed, inclined to think that the bulbs of this Lily are not truly perennial, and perish from the mere act of reproduction by seed, like those of *L. papyraceum*. This, however, may not be their habit in nature, or even in all parts of England. The Lily called *pumilum* by Von Sprecke, which was introduced by him from Japan, is, in Mr. Lichtenstein's opinion, merely a cultivated form of *tenuifolium*. It does not appear to be common in Japan, if, indeed, it is indigenous, as I have seen no specimen in any herbarium.

The bulbs of this Lily which are imported from Russia have a somewhat different appearance from the one shown in the Plate, the scales being longer, thicker, and less numerous; they are sometimes curiously bent; but these details will be best shown by woodcuts at the end of my work.
THE SCARLET MARTAGON LILY.


L. rubrum angustatum var. Martagon constellatum-floratum, Park. Parad. 34.

L. angustatum miniatum, Bush. Pin. 78.

Bulbus ovatus, perennis, florescent sparsius, pluriannualis, lanceolatatis. Caulis strictus, puberulus 3-4-pedunculis villoso-purpureo distinctus.

Foliis 100 vel pluribus ascendentiis confertis scarios, pallide violaceis, inferius obscuratis, axillis laminis 2-3 poll. longis, 2-3 lin. latis, 6-6-petatis, marginebus et venu s foliorum infraerosa distinctus, papillosis, superioribus minus ad pollicem adpunctis. Rachens 1-10-pedunculis, pedunculis spicis cumulis, sepe preservatis. Perianthium inodorum 1-2 poll. longum, longum, spathideum miniatum, segmentis obscurae sectae rostellati media 5-6 poll. latis, papillis expansis, flores distincto impresso marginebus glabris. Filamentis 12-14 poll. longis, antheris 4-4, poll. longis, pollinis minatis. Ovarium 5-6 poll. longum, stylis subepigyno-longum vel paulo brevioribus. Capsula obtusa angustata, spicis multilibata.

Hab. Grecia et insulae Ionicae, herbae meonei Bulbi et Augusti flores.

Bulbus large, globose, of an orange-yellowish color. Stem erect, stout, 2-4 feet high. Leaves many, scattered, 3-5-curved and largest in the center, and becoming smaller and narrower above, where they are compressed to the stem. The veins and edges of the leaves distinctly ciliate, with five, short, white hairs. Flowers 1-10, subepigynous, hanging. Peduncles 2-4 inches long, generally bractolate. Perianth 1-2 inches deep, bright crimson, the segments much reflexed, papillosae on the lower half, with a distinct glabrous groove. Styles 6-8 long, much curved. Filaments about an inch long; pollen scarlet. Capsule pyriform, with multilobate apex.

The Chalcedonian or Scarlet Martagon Lily is found wild in many parts of Greece and its islands, up to a considerable elevation on the mountains, as at Psara on Mount Parnassus at 2000-3000 feet elevation, and in ravines and woods on Mount Malevo at 4000 feet; but I have no certain proof of its occurrence in Turkey or Asia Minor. Brought from the Levant in the 18th century, at the same time as many other bulbous plants, it was well known to Clusius, Parkinson, and the other old writers on plants.

Now, however, owing to the complete revolution in the arrangement of our flower gardens, which has driven so many old favourites out of notice, the Scarlet Martagon, though one of the most brilliant and easily cultivated of plants, is more often seen before a cottage door than in the gardens of the rich, and in Gloucestershire is a very common and well-known plant.

It seems to prefer heavy rather than light soil, and will luxuriate in uncultivated corners where few plants can thrive. Deep shade, however, is not very congenial to it; and it is more seriously affected by transplantation than most other lilies, so that it does not attain its full size or number of flowers for two years after it has been moved.

There are, as far as I know, no remarkable varieties of this species now in cultivation, though several supposed varieties are mentioned in catalogues. What is called Chalcedonius major does not appear to be more than a luxuriant state of the common sort; and the wild plants which I have seen imported from Greece, though smaller and fewer-flowered, are very similar to those which have been perhaps for centuries in cultivation. I have never seen a double-flowered form, which is spoken of in terms of great admiration by some of the older writers; and, judging from my experience of other double lilies, it would be far inferior to the single flower. L. chalcedonicus rarely produces seed under cultivation; but as it is easily increased by offsets and the seedlings grow very slowly, this method of propagation is not often followed.

The species referred to by Mr. Baker in the ‘Linnian Journal’ as L. albicans of Grischach is really L. pyrenicum; and L. gracile of Exel, from Montenegro, the type of which I have examined, is a species of Frigilia.
LILIMUM BROWNII.

BROWN’S LILY.


Bulb round, white, rather flattened on the top in cultivation. Stem 1—3 ft. high, erect, glabrous, tinged and spotted with purplish. Leaves scattered, 4—6 inches long, 5—6 lines wide, dark green, purplish towards the tips. Flowers usually one, but sometimes two or three, sweet-scented. Perianthi 5—6 inches long, pure white inside, but strongly tinged with violet-purpureous on the outside, broader and more open than in L. longiflorus and narrowed more gradually to the base; segments oblongo-acute, slightly falcate at the tip. Style and style-stigma a little longer than the perianthi-segments. Filamenta white, 4—5 inches long; ovarium large; pollen red-brown, or, perhaps, in some cases yellow. Capsula ovarioidea, 2 inches long, rarely perfect in cultivation.

This fine plant was introduced to Europe from China, as long ago as 1894, by Capt. Kirkpatrick of the East-India Company’s service, and has been sparingly cultivated in England ever since. It has been figured several times under the name of L. japonicum; but as that name has been applied to a very different plant, and is also untrue as regards the native country of this one, it must take the name of Brownii, by which it is already very well known in gardens, and which was first applied to it in 1841 by Milliez, after a nurseryman of Slough, in whose “Catalogue” it was brought to notice about 1838.

As a cultivated plant, L. Brownii is known in parts of China and Japan, but its native country was not known with certainty until recently. There are specimens in the Kew Herbarium, gathered by Mr. Olcham on Herschel Island, one of the Corean archipelago, which I think may safely be referred to this species; and I was pleased to discover among the plants collected by A. David in the mountains of Kiangsi, in Central China, specimens which differ in no important point from L. Brownii, though the colour of the pollen appears to have been yellow rather than red.

I have seen no varieties of this plant worth notice, and cannot allow that what is figured in the Flore des Serres recently as L. japonicum Collectorti is distinct from L. Brownii. Probably the slight differences which may be found in it may be attributed to the fact that it has been recently imported from a Japanese garden, whereas the old strain of Brownii is from China and has been cultivated in Europe for seventy years.

Such slight variations as may be discovered in plants grown under very different conditions do not, in my opinion, justify their being treated as different plants, however desirable such a course may seem to those whose only object is to swell their catalogues and bring out old plants under new names.

L. Brownii is one of the finest species we have in places where it succeeds, but is rather particular as to the quality of the soil, and has never become at all common in England.
From what I have seen of its cultivation on the continent, where it is largely grown by some of the Dutch and Belgian nurserymen; and at Berlin, where it is counted by thousands, I imagine that a very light soil is necessary to its well-being. In the late M. Van Houtte's nursery at Ghent there was a bed of it in great perfection, many of the plants bearing two or three flowers on a stem, though the soil is little better than sand enriched with manure. In Musson, Osborn's nursery at Fulham I have been told it used to thrive; but, though perfectly hardy, one rarely sees it doing well in private gardens.

I have never been able to procure a perfect capsule; but I am informed by Henri Leichter that the seed germinates quickly, as in all the Eolirium group, and would probably flower in the fourth or fifth year of growth.

The purple colour on the outside of the flowers of E. Browni varies in depth according to the amount of light the plant has received, and is not so dark when growing in a shady place. My figure was taken from a plant grown by Col. Trevor Clarke, of Welton Place, which flowered early in July 1876.
LILY MONADELPHUM.

THE CAUCASIAN LILY.

L. monadelphum, M. Hott. Fl. Taur. t. 287; Cent. Pl. Ross. t. 4; Grew. Bot. Mag. 1468; Kunth, Enum. 293; Regel, Garten- 

flora, t. 783.


Bulbus evolvens, latecerus, perennis, separantibus pluribus lanceolatis. Caulis 2-3 cephalis, robustus, viridis, puberulus. Folia 30-60, 

grana, ascendentes, lanceolata vel oblanceolata, viridula, distincta multicornita, centralia 3-4 poll. longa, medius 6-12 lin. lata, 

dumae et marginibus ciliata vel pellucida. Ror tunes armploides 3-14, interdum 14-25 sepals, puberulis 14-12 poll. longis, 

apice curvulis, breviter magnis lanceolatis. Petalumum unevolutum, sulphureum, 7-9 poll. longum, segmento exarantulo 

infra medium foliato, 9-12 lin. lata, basi et apice purpureo tincta, facie plus minusque panicula minuscule nigroargenteo 

decore, nullo modo palpibus, foveulis glabra huitet impressa primita. Filamenta 18-21 poll. longae, applanata, e basi 

bulbis intusi superficia valvata, obsidii 6-6 poll. longius pollicis sulphureo. ovariiun 7-8 lin. longum, stylo subangusto duplo 

broden. Capsula oblonga, 18-21 lin. longa, obtusae angulata, apice umbilicata.


L. Loddeioides, P. M. Flora Rosse, t. 68; Lemaire, Journ. 204, non Schultes, fl. Flora des Rosse, t. 207.

Robustus, folia latioribus, flexibus majoribus, segmentis supra medium revolutis, pollicis fusco-coccineis.


L. pyramidum, Bula. in Herb. Pyræ, ex de Leidii!

Humilior, foliis angustioribus, lanceolatis, tenuioribus, medio 4-6 lin. latis, rubris quatuor pellucido. Segmenta pertinacii 

6-8 lin. lata.

Heb. Inversita. Tschch., alt. 4690 ped. Lazizah (Balana)!

Bulbus laevis, globosus, yellowish. Sono 4-5 feet high, stout, rather puberulent. Leaves many, scattered, lanceolata, 4-5 inches 

long. 1 inch broad, with 10 or 12 distinct veins, clothed short hairs beneath and at the edges. Roots over a foot 

long, many-flowered. Pedunculus erectae, ascending, 4-6 inches long. Bracteae foliata, 2-3 inches long. Perianth 3-4 inches 

decrefo, form of the seed, bright lemon-yellow, with copious minute spots of purple-brown, tinged at the 

base and with purple-brown. Filamenta 2 inches long, placed edge to edge at base but not united; pollen yellow. Owry 

7-8 lines, style 15 lines long. Capsule large, obtusely angulat.

THE Caucasian Lily is one of those which must be considered indispensable to every garden, great or 

small. Its hardy constitution, sweet scent, and early-flowering habit, are all points which tell greatly 

in its favour.

It appears to be exceedingly abundant in many parts of the Caucasus. Mr. FRESHFIELD, in his charming 

book of travels, speaks of it as growing in the valleys amongst a rank growth of herbaceous plants, at 

elevation of 4000-6000 feet. In England it certainly likes a strong soil, and when well established grows to a 
bheight of 3-5 feet. It is one of the earliest in flower, and ripens seed freely in most seasons. The scent, 

though unpleasant to some persons, and too strong to make it desirable as a pot plant, is to me agreeable, though 

less so than that of L. auratum and other Lilies. The seed, if sown at once, germinates very quickly, but, as was 

first pointed out by Professor DUCREUX, does not show its cypelidon above ground. The seedlings grow 

very slowly, and, as I am informed by Mr. ELACOMB, sometimes do not flower till the tenth year after 

sowing. This is a trial of patience too much for most amateurs, though the bulb-growers of Holland, more 

accustomed to such operations, have lately raised large quantities from seed.
Though introduced by Messrs. Lodges early in this century, it has not become common until the last few years; when it has been imported from its native country in large quantities. Being a very variable species, it has been described and figured under several different names by various authors; and though the varieties are clearly distinct, yet they run into each other so closely, that I think best to follow the high authority of Mr. Baker in considering them as varieties only.

The plant was first described by the Russian Botanist, Philipp von Siebold, having been found in the Caucasus when those mountains were first explored by Russian naturalists. By Lederer it was considered to be the same as L. pyramidalus; and though that opinion may seem ridiculous when a fine and well-grown plant is examined, yet one of the varieties, which Mr. Baker has distinguished as var. Ledereri, is but little different from the Pyrenean plant.

The monadelphous character of the stamens does not appear to me to be a constant or reliable character. It varies very much in different plants—some having the filaments united for at least one third of their length, and others only at the base or (as is more common in the variety called Senticinum) not at all.

The plant described as L. pyramidalus by Prof. Carl Koch, of which I have seen the type specimen in the Berlin Botanical Garden, does not appear to me to be in any way separable from this species. The living plants cultivated in the Berlin Botanical Gardens certainly are not so; and I am confirmed in this belief by the opinion of Prof. Koch himself. There is, however, in the mountainous region of the Black Sea a much smaller and possibly distinct plant, collected by Balanska and distributed in herbaria by M. Bensmann as L. pyramidalus.

As far as I can learn, the variety monadelphus (which is here figured from a plant which flowered in my garden in June 1874, and produced in 1876 twenty-nine flowers on one stem) is confined to the northern and eastern parts of the Caucasus region; whilst the variety Senticinum (of which a plate will be given shortly) is only found on the southern slopes of the mountains in the provinces Ineritia, Mingrelia, and Georgia.

I would here point out that, though I am not at all confident that these two forms can in all cases be well separated, yet, as a rule, they may be distinguished by several characters, among which the colour of the pollen, which is red-brown in Senticinum and lemon-yellow in monadelphus, is the most conspicuous. Monadelphus is also from a fortnight to three weeks earlier in flower, and, when first showing above ground, usually has its flower-buds exposed, whereas in Senticinum they are concealed by the leaves until the plant is just ready to bloom.
LILITIUM JAPONICUM.

KRAMER'S LILY.

L. Elizabeth, Hort. Leicht.


Bulbs small, about 1-3 inches thick, pyriform, whiteish. Stems 1-3 feet high, erect, glabrous. Leaves scattered, linear-lanceolate, acuminata, shortly petioled, 2-nerved, 4-6 inches long, 4-10 lines broad. Flowers 1-5, white or rose-coloured, sweet-scented. Perianth 4-7 inches long, shaped like that of L. auratum. Filaments with the stamens shorter than the perianth, anthers large, with red pollen. Ovary 1 inch long; style slightly declined; capsule bluntly angled, about an inch and a half long.

THE charming Lily here described has a curious history, and affords an additional proof of the necessity of studying such plants from living rather than from dried specimens. When introduced to Europe a few years ago it was considered a new species, and figured as such in the 'Botanical Magazine'. Professor Maximowicz, on seeing the plant in flower at Mr. Wilson's in 1873, told me that it was known to him in Japan, and had been regarded as L. japonicum of Thunberg. To make this certain, Mr. Baker was good enough to procure, through the kindness of Prof. Anderson, of Upsala, the specimens of Lilies collected by Tswenberg in Japan, after examining which we both agreed that the original plant named japonicum by him was identical with what had hitherto been known as Krameri, and not, as was supposed, with L. Browni.

I have little doubt that the Lily described as L. bellesdiana, from a drawing made by Mr. Hanson of New York, and kindly sent me by him, must also be referred to this species; for though I have not seen the plant from which the drawing was made, I have seen forms of L. japonicum very closely resembling it. Both L. Krameri and L. bellesdiana have been supposed to be hybrids; but from what I can learn about the plant in its native country, I think there is little doubt that it is a distinct species, occurring abundantly in some parts of Southern Japan.

Professor Maximowicz did not see it himself in a wild state, but had it brought him from a considerable elevation in the mountains of Shamo, in the Island of Nippon, and Mr. T. Hooe, an American gentleman who has sent home large quantities of bulbs of this plant, says that it grows wild near Lake Biva, on the hills of Kito, in South-west Japan.

Until 1876 it was, owing to the difficulty of importing its small and rather delicate bulbs alive, one of the rarest Lilies in our gardens; but large importations having been received in first-rate condition during the last two seasons, it has been sold at a more moderate price than formerly, and has become better known. If healthy bulbs can be procured, there seems to be no particular difficulty about growing them, though I must confess that no one has, to my knowledge, rivalled Mr. Wilson in his successful treatment of this Lily.

In his hands it attains a height of 3 feet, or even more, and produces one to four or five flowers of a great size and beauty; but more commonly, in my own garden, it assumes much dwarfer proportions, as in
the variety distinguished by Mr. Baker as Bawinsum. If cultivated under glass, it should be treated exactly like L. meionium; but it may be grown and flowered out of doors with success. Its propagation at present is little understood, as offsets are not produced freely, and the seeds, if obtained, seem to lie a year in the ground before germinating.

At the Vienna Exhibition in 1874 a large collection of Lilies was sent by the Japanese Government from the Royal Gardens at Miaco, accompanied by excellent drawings from nature. Among them were several forms of L. japonicum, varying considerably in size, form, and colour. One of the most beautiful of these (which I saw flowering in Henu Lauretters's garden in 1875, under the name of L. Elizabetha) was a large pink-flowered form resembling the one which I have figured; and it is possible that some are hybrids between L. japonicum and L. carolinum, which is nearly allied to it.

The plants here figured are the rose-coloured and the white variety, and were both drawn at Mr. Wilson's residence in June 1876. The outline of a petal of a singular laciniate form is also given, though this malformation is probably not permanent. In the "Gardeners' Chronicle" for August 11, 1877, Mr. J. H. Kleinsass, of Haarlem, mentions a fine purple-flowered variety in his garden, which I have not as yet seen elsewhere.
LILIJUM MARTAGON.

THE MARTAGON LILY.


Hab. Europa occidentalis et aliae ad Siberiam.

*L. hirsutum, Mill. Dict. no. 10 (L. Miller, Schultes, Obs. 67), est forma robusta caele polynuc.

*L. plebeum, Spreng. Syst. fil. 62, est forma floribundis caele glabris folliis albidibus pollinis late. Ascendit formam floribundis viscoso-impunctatis et carnosis.


*L. dolomiticum, Pl. dei Serres, 2127.

Segmento petalum ensiformibus, auriculato nigro-viscoso-purpureis, pollinis obsoletis.

Hab. Alpes Dinarici.

Bulbus ovatus, oblongus, flavus, 3-6 inches thick. Stem 3-6 feet high, erect, toro, pubescens vel glabrum. Leaves in whorls of 6-9, with a few scattered ones below the flowers, spreading horizontally, glabrous or slightly downy beneath. Flowers 3-5, or in cultivation up to 8, arranged in a narrow pyramidal rosette; lower pedicels 3-8 inches long, drooping at apex, not broad-based, but having a pair of bracts at the base. Peduncles 3-8 inches long. Melanocarpae, or those coloured flowers. Ovary 4-6 lin. long, style slender, 8-9 lin. long, curved from the base; filaments as long as style, much curved; pollinia redish. Capsule turbata, acutum angustum. 1 in. long.

The Martagon Lily is so well known to everyone that it is hardly necessary to describe it. It has been so long in cultivation, that we have no record of how and when it was introduced. It may perhaps be indigenous to this country, though more probably, where found in an apparently wild state, it has escaped from cultivation. It is found all over Western, Central, and Eastern Europe to Siberia, as far north as lat. 67°, and in the Caucasus and Gurk Mountains, growing in hilly districts in meadows or on the borders of woods, among long grass, up to an elevation of 5000 or 6000 feet.

The varieties of *L. Martagon* are numerous; but, as far as I know, only two are found in a wild state, namely—*L. hirsutum* of Miller's "Garden Dictionary,"= "L. Miller, Schultes, which is figured in the Bot. Mag. pl. 893, and is found wild, according to Professor Karl Koch, in the Hartz Mountains and Thuringia; and, secondly, *L. plebeum* of Sprengel's "Systema Vegetabilium," figured by Jacques in the "Flora Austriaca," and also in the Bot. Mag. pl. 1634. This is the one most commonly seen in gardens, and is the kind generally found in Switzerland.

The White Martagon, of which I have given a representation on the Plate, is another very pretty variety, not rare in gardens, where it probably originated. There are also many others, varying more or less in colour, size, and spotting, which are occasionally seen at the present time, but were much better known two centuries ago (vide Parkinson's "Paradise," 31, where a long account of them is given).

The very distinct variety of this plant usually called *dalmaticum*, though it had been previously described under the name of *Cattanei*, was hardly known to cultivators until 1875, when it was introduced in quantity through the agency of Herr Max Leichlein, who undertook a journey to Dalmatia on purpose to find it.
He informs me that, having received information of the district in which it grows, he started in September 1874, and, after a journey of seven days by steamer from Trieste, landed at Cutaro. From here he went into a very wild country on the frontiers of Turkey, and, after much inquiry among the natives, discovered the plant he was in search of. He says, "The Lilies begin to grow at about 3000 feet elevation, and are most numerous in the Grivasca, the rocky bed of an extinct glacier. Here the chalky ground is cut up at intervals by crevasses some 40 to 50 feet broad and 80 deep, in the bottom of which ice and snow were lying. Wherever on the sides of these crevasses a little earth is lodged, the Lilies grow, having their roots close to the rock in a calcareous gravel."

The colour of this plant is an extremely bright, though dark, purple, not easy to describe or imitate, and is a little darker than that of the variety called Cattamia, which is found more to the northward in the mountain-forests of Vellichio.

Nothing can be simpler than the cultivation of the Martagon Lily. If planted in good soil of a stiffish character, and undisturbed, it will always be an ornament to the garden. I have a clump now in bloom, on which there must be at least three hundred flowers out at once, some of the stems bearing as many as forty to fifty. The seeds of L. Martagon germinate readily, but grow very slowly, and take seven or eight years to produce flowering bulbs.

I have figured the Dalmatian variety of the Martagon in preference to the common sort, as, though just as easy to cultivate, it is so much more beautiful and less known. I have also given a representation of the white variety and of a pale pink one which I found in the garden of Col. Trevor Clarke.
LILY SUPERB.

THE SWAMP LILY.


Bulbous breviter aristiformis, camus, squamos niko inermis. Canalis 3-5-punctis, robusta, globosa, purpurea tenebrosa. Folia in verticillis 3-4, 3-10-deltio clausa, argentea submembranacea, nervis, brunneis, velutina, glabria, 3-5-nervatis, infusoria 4-5 poll. longa, media 6-9 mm. alta. Flos 6-10 in pedunculo determinato 9-10 poll. latum dispositi; pedicelli apice convexi, infundibulo 3-5 poll. longi, divaricati. Perianthium 3-4 poll. longum, splendidum triumbasis, segmentis acris lanularia, media 6-9 mm. latis, profunde revolutis, limbis inferius punctis vascum decoratis; palliditi lanularia, floribus impressis supero globosis praeclabitis. Filamenti 2-21-pollinis, valde divergentes; antherae rostellis, 6-9, latis. Ovarium 3-12, longum, stylo decussato pabulo brevissimo. Capsula obovata, oblonga, 6-angulata.

Bulb. A Canada ad Carolinam, in locis altissimis.

Bulb round, white, produced annually at the end of a short rhizome, like that of L. candidum, but usually shorter and stouter.

Stem 5-6 feet high, strong, glabrous, tinged with purple. Leaves in whorls of 6-10, dark green, 3-5-nerved. Flowers from 6 up to 30 or 40, in a broad pyramidal raceme. Perianth 3-4 inches long: the segments much recurved, bright orange-red with purple spots, and a green triangular mark at the base of the three inner segments. Ovary, ovary, style, and capsule much as in L. candidum, but larger.

The Swamp Lily is found commonly in most of the Eastern States of North America, from Canada to Carolina, growing in wet and swampy ground which is sometimes under water all the winter. Mr. Hanson tells me that he once found a spot in New Jersey where there were at least 5000 plants of this noble Lily all in flower at once, ranging up to 6 feet high, and bearing as many as 30 flowers; but out of the whole number it was difficult to find three exactly alike. The western range of this plant is not well known; and towards the Southern States it merges into a distinct form or species known as L. carolinianum, Mich., of which I shall give a figure separately. According to Parry, Anna Gray, the Swamp Lily also approaches L. candidum very closely in some of its forms; but, as far as I have seen, they may always be distinguished by the green triangular marks at the base of the inner perianth-segments, and generally by the purple colour of the stem.

L. superbum, in suitable soil, attains a great height and beauty, but is rarely seen in perfection in England. It likes a deep, wet, peaty situation, and will hardly exist on dry or calcareous soils. It may be seen to great advantage in the nurseries of Mr. A. Waterman, at Knap Hill, at Mr. P. Banks's grounds, and elsewhere.

It has been introduced into this country for at least a century, perhaps longer, and is now tolerably common. Its bulbs are impatient of removal, and should never be disturbed when the plant is in a thriving state. It produces seed freely, but this does not germinate for a year or more after sowing, and is very troublesome to raise. Though in size, number, and colour of flowers the plant is very variable, I have seen no variety worth naming, what is known as L. superbum pyramidal which is simply a luxuriant form of the plant when well established in deep moist soil.

My figure was taken from a plant which flowered at Mr. Wilson's towards the end of July 1875, and, though not showing the green star at the base of the flower as plainly as I should wish, is a very good representation of it.
LILUM LEICHTLINI.

LEICHTLIN'S LILY.

L. Leichtlinii, Hook. 61, Bot. Mag. t. 5671; III. Hort. t. 560; Flora des Sérres, t. 1738 & 2181-92; Bulb. Hort. 1855, t. 11.
Flori Mag. t. 569.


Var. MAMM., Wilk, in Journ. Hort. 1875, 971, una forma, sed forma luxurians herbaria.

Hab. Japonia (MAXIMOVITZ).

Bulb small, white, with a few thick broad scales. Stem 2-4 feet high, not ascending directly from the bulb, but creeping underground horizontally to some distance from it, and bearing small bulbs at intervals upon its underground portion. Leaves scattered, 30-40 in number, 3-4 inches long, 3-4 lines broad, sparsely pointed, and gradually narrowed to the base, distinctly serrated, obscurely puberulous beneath. Flowers 1-5 or sometimes more; pedicels 3-4 inches long. Perianth 2½-3 inches deep, bright yellow; the divisions much reflexed, lanceolate, ½ inch broad, spotted copiously with purplish red, the base broad, with the groove edged with hairy line. Ovary ½ inch long, style 2 inches, filaments 2½-3 inches, anthers ½ inch; pollen reddish. Capsule unknown to me, but said by Professor Maximowitcz to be large, and flat at the apex, with six prominences.

The handsome Lily which bears the name of one who has perhaps done more for this genus in a horticultural sense than any other person, Herr MAX LEICHTLIN, of Baden, was first brought to notice by its accidental appearance amongst a bed of Lilium auratum in Museus, Varren's Nursery in 1867. Since then it has been imported sparingly from Japan, and has been cultivated with indifferent success in Europe, though, as Mr. Wilson has shown, there is no reason why the plant should not be grown and propagated with as much ease as many other species. The creeping habit which is characteristic of this Lily must always be taken into consideration, as if planted in a small pot, the shoot is apt to get broken or checked in its growth; and as it is never very robust, in many cases death ensues. If planted in the open ground, care must be taken that the soil is light and protected from the hot sun, as this Lily is easily scorched up and injured by drought in summer.

Very little is known of the plant in its native country; but I am indebted to Professor Maximowitcz for the following information:—"I had this Lily first from the gardens of Yedo, in 1862, blossoming at the end of July and in August, under the name of 'Hirado Yuri,' i.e. Lily from Hirado island; but the native botanists call a plant which seems to be a variety of L. egaus by the same name. In the middle of November I get it in ripe fruit from the woods at the foot of Finland-yama. From here it is said to extend throughout the Iden peninsula to the neighbourhood of Yokohama, but nowhere very common. It bears 1-7 flowers, and differs from L. Maximowitczii in the following particulars:—

"L. Leichtlinii.
The stem is terete; pedicels longer than flower.
Stem bracteate mostly in the middle; perianth-segments longer, narrower, more revolute; stamens and style longer; filaments narrowly subulate; style club-shaped, thickened.
Capsule three times as large, flat at the apex, with six prominences."

"L. Maximowitczii.
The stem is winged and angular; pedicels shorter than the flower.
Stem bracteate at the base.
Filaments broadly subulate.
Capsule umbonate."
As Professor Maximowicz is perhaps the only botanist who has had the advantage of comparing these species in a wild state, great weight must be allowed to his opinion; but I cannot withhold the remark that, however different they may appear at first sight, I am not inclined, as far as my experience of them in cultivation goes, to allow much importance to these characters. In fact, if it were not that such good botanists as Dr. Hooker and Mr. Barne had treated this plant as a distinct species, I should be inclined to join it with L. pseudoangucrinus and L. Atkinsonii. The colour of the flower, however, will always distinguish it from either of these, and does not seem to vary at all.

The form distinguished as L. Leichtlinii major is, I believe, in a great measure the result of the superior cultivation for which Mr. Wilson is so distinguished, as I have not seen it except in his garden. I am indebted to him for the plant here figured, which flowered at Heatherbank in July 1876.
**LILITME CALLOSUM.**

**SIEBOLD'S LILY.**


_Fine-Junt, Kingdom*, Amur. v. 871.


_Hib. Japon. et Insulae Leningr. (MAXIMOWITZ, OCHUM, BEERDEN).*

**VAR. SYSTROMILLOM.**


*L. ecklonis*, Maxim. Fl. Amur.

*L. punicum*, Regel, Gardeh, 1865, t. 363, fig. 1, et Hort. Loebellin, non D.C.

Casia brevifolia, foliis latifoliosis, benestis laud valens callosum.

_Hib. Manchurica (MAXIMOWITZ).* Diversa amo-orientalis (MAXIM.).

Bulb globosus, ad 1 inch thick, cum oblongo exconfertis white scales. Stem 1½-2 feet high, slender, terete, glabrous, green, shading to purple at base. Leaves 20-30, scattered, lax, linear, 3-4 inches long, 1-2 lines broad, narrowly graduated to the base, cuneately pointed, the edges slightly revolute, 3-5-seriata. Flowers 2-3; pedicels arcuate, ascending, 1-5 inches long, subenditl (in the Japanese plants, though not so distinctly in the Siberian specimen) by a pair of hairs, callosis at the tip. Perianth subminiatum, cum obscure black dots on lower half, 1½-2 inch long, the segments oblongo-ellipticis, 3-4 lines broad, obscurely pubescent, recurved from about half their length. Ovary conic, 1 inch long; style ½ inch long. Filamenta about 1 inch; anthers sessile, 3-4 lines long; pollen scrobiculatus. Capsula l½-2 inch long, narro in proportion to its length.

**THE plant here described is one which, until quite recently, was little known in Europe, and as it has been confused by authors with another species (L. trumiformis), I have taken an early opportunity of figuring it.**

Originally described and figured in Siebold's fine folio work on the Flora of Japan, it was afterwards discovered by Professor Maximowicz in Amurland and Manchuria, and introduced by Maack to the Botanic Garden of St. Petersburg in 1859. The continental variety which he sent, being in some points unlike the Japanese plant figured by Siebold, was supposed by Dr. Regel to be the _Lilium punicum_ of Regel, and was figured by him under that name in the 'Gartenflora' for 1865.

This variety was afterwards described by Mr. Baker in the 'Journal of the Linnean Society,' from a drawing of Mr. Linnell's, as a variety of _L. trumiformis_. On a subsequent examination of the plant in a living state, and comparison with dried specimens from Japan, however, Mr. Baker agreed with me that it is really not distinct from Siebold's species, though the callosous bracts, which in his figure are probably somewhat exaggerated, are hardly visible in many specimens.

Professor Maximowicz of St. Petersburg, to whom I applied for information, confirms this opinion, and tells me that this variety, which he calls _punicum_, is smaller and lower than the Japanese variety, has fewer flowers, broader leaves, and less conspicuous bracts. He found it rare in Manchuria, in the low flats along the
Sanga river; but more common on drier meadows further up the same river, where it flowers in the month of July. The Japanese plant is found abundantly round Nagasaki, at 500–2000 feet elevation, in mountain-pastures, where it flowers from July to the end of September—also in grassy valleys at the foot of volcanic mountains in Sinabara; he did not find it, however, in the island of Nippon.

Simons tells us that he found it growing, in company with such plants as *Scilleon, Lepidium, Veronica*, and various grasses, on the slopes of volcanic mountains. He also states that the bulbs are collected and eaten like those of *L. regnum*, either boiled or roasted. They are very nourishing and agreeable in taste, and are used in a preserved state as a remedy for chronic coughs.

As an ornamental plant this species has little to recommend it. Its flowers are small and dull in colour compared with most Lilies; and though it is quite hardy and easy of culture, it is not likely to find favour in the majority of gardens. The specimen figured flowered in my garden in July 1875, from a bulb sent me by Dr. Read, in the previous autumn. It produces seed in good season; but, being now tolerably abundant in cultivation, I have not attempted to raise it. I believe that most of the plants now in England are of Russian origin, and belong to the Siberian variety, as I have seen none which showed the calyx bracts as distinctly as they are shown in dried specimens from Japan.
LILIUM PARVUM.

THE SMALL-FLOWERED ROCKY-MOUNTAIN LILY.

*L. parvum*, Kellogg. Proc. Col. Acad. ii. 179, t. 52; Regel, Gartenflora, t. 725; Dechastel, Obs. 98.


Bulbus brevior rhizomatis, epigynus basi articulatus, albus. Caulis 2-3 pedalis, teres, viridis, glaber, infra ramosum unusus.

Folia verticillata vel sparsa, 2-3 ped.lung, 4-6 lvs. lat. Racemus laxus 2-30 florum, pedicellis ascendentibus 2-6 ped.


Capulla transon 4-6 lvs. longa, 5-4 lvs. obtusa angulata.

*Loca.* California, ad montes Sierra Nevada, alt. 4000-6000 pedes (Kellogg; Bolander; Royle).

Bulb small for the size of the plant, shortly rhizomatosus, and composed of many loosely attached, small, white, jointed scales. Stem 2-5 feet high, usually asked below the raceme. Leaves scattered, or in whorls of 3-10, lanceolate, 2-6 inches long, 4-6 lines wide. Flowers 2 or 3 to 30, or sometimes even as many as 50 in number, disposed in a loose raceme on suberect pedicels, 3-5 inches long, inclined upwards or horizontal, but never drooping. Perianth 15-18 lines long, pale or dark orange, usually spotted, the segments outlined for about a third of their length. Style straight, twice as long as the ovary.

Capsule short, oblong, smaller than in any of the allied species.

The name of parvum, though applicable to the flowers of this plant, which are small in comparison with those of its nearest allies, is certainly not descriptive of the species; for though not usually seen in a thriving condition in Europe, it is said to attain in its native mountains a height of 5 feet, or even more. It has only been known to the scientific world since 1868, when Dr. Kellogg, of San Francisco, described it; and though not recognized as a distinct species by Mr. Baker, I think I can clearly show that, though a variable plant, it never approaches any of the forms of *L. candidum*, and may also be distinguished from any other Lily by its bulb, capsule, and the form and position of its flowers, which are always more erect than drooping.

It is a native of the higher parts of the Sierra Nevada and other ranges in the Pacific States of North America, where it is found at an elevation of 4000-6000 feet. It is said by Dr. Bolander to grow exclusively on the banks of mountain-streams, or in shady swampy places through which a constant stream of cold water runs.

It was first introduced by Mr. B. Ronza, who sent it to Herr Leichtlin in 1872, and was figured in the ‘Gartenflora’ in 1873, though, owing to the weak condition of the plant, that plate does not give a good idea of its real character.

There are many varieties of colour, some without spots, and some much deeper than the plant figured; but I have never seen any departure from the characteristic form and position of the flower. Five of these varieties are named by Mr. J. H. Kellogg, of Haarlem, in his ‘Catalogue of Lilies’ for 1874.

The bulbs of this Lily sometimes grow in large masses which produce a number of stems and many flowers in every direction; the scales are usually articulated in three or four places, and are very fragile. On this account it is best to leave it undisturbed as long as possible, until, either from the exhaustion of the soil or from the overcrowding of the stems, it becomes necessary to divide it.

It appears to succeed best in moist peaty soil, and if undisturbed soon acquires vigour; though I have nowhere seen a finer example than the one here figured, for which I am indebted to Messrs. Baker and Sessions, in whose grounds it flowered in July 1875.
LILIMUM NEILGHERRIENSE*.

THE NEILGHERRY LILY.

*L. neilgherrense*, Wight, in t. 2061-2 ; Baker, Lit. Journ. xiv. p. 239.

L. touloumni, Wight, in t. 2083-4.

L. Wallisii, Wight, in t. 2085, non Salmon, ill.


Bulb roundish, composed of firm, thick, compact white or purplish scales. Stems usually creeping at the base, sometimes for a distance of 1-2 feet, bearing many bulblets on its submerensuous portion, 2-3 feet high, stout, glabrous, green, or tinged purple. Leaves 30-40, lanceolate, crease-paired, the lower ones 5-6 inches long, 8-12 lines broad, the upper ones becoming much shorter but not narrower, 3-10 inches. Flowers 1-3, or none, drooping in the bend, horizontal when expanded, white or lemon-yellow, occasionally pink-tinted. Petals 6-12 inches in length, with the tube narrow for nearly half its length, and the mouth widely expanded and slightly recurved. Segments broad, distinctly keeled, and valves at the tip. Sepals shorter than the style, much narrower, pale yellow. Capsule 1½-2 inches long, oblongulate at the apex.

TWO years ago I should hardly have ventured to publish the plate here given, lest I should be said to have exaggerated the size and beauty of this flower; but I am now confident that, so far from exceeding in these respects the limits of truth, I have, if anything, fallen short of them.

Lilium neilgherrense has larger flowers than any plant belonging to the Order Liliaceae with which I am acquainted, as, in dried specimens which I have examined, they exceed a foot in length, and, though not so attractive in colour as in some other kinds, are most elegant in form and deliciously scented.

The late Dr. Wright, whose great illustrated work on the plants of Southern India will always remain as a monument to his labours, first discovered this plant in the Neillgherry Hills, to which, with a few other mountain-tracts of moderate area in Southern India, it is restricted. Though nearly allied to Wallis's Lily, which represents it in the Himalayas, and varying considerably in itself, the Neillgherry Lily may be looked upon as a distinct and fairly well-marked species—always to be recognized by its long-tubed open-mouthed flower, its creeping stem, and short leaves.

Though found in hilly parts of the Mysore territory, north of the Neillgherries, this Lily is not known with certainty to exist in the Aramandly and Cardunam Hills to the southward; but when travelling through these little-known regions in March 1876, I found what I believe were the withered stems of this plant; and, judging from the resemblance of the form of these mountains to that of the Neillgherries, I have little doubt it will be found in them wherever suitable localities exist.

Mr. R. Morgan tells me that L. neilgherrense is generally found growing in rocky and precipitous places, and also amongst low Animosa bushes on hillsides. It luxuriantly in the black loamy soil found in the clinks and crevices of large rocks, and thrives in a comparatively warm climate, such as that of Coonoor, at about 5000 feet elevation—though also found up to 8000 feet, on the Snowdon and Dodabetta peaks. It flowers in September or October, and ripens its seed in January or February.

* According to the modern system of spelling Indian names this should be Neilgherrense (the Nilgiri Lily); but as the name has been spelt by Wight and Barrow in the conventional way, I think it best, to avoid confusion, to adhere to it.
It was first introduced in a living state to Europe, as far as I can learn, by Mr. Lowne, when travelling for MESSRS. VERTEN and SONS; but either because the bulbs which he sent were not in good order, or from some other cause, the plant was never distributed, and, though exhibited at a meeting of the Royal Horticultural Society on July 22, 1869, and figured by LEMAIR in the tenth volume of the 'Illustration Horticult.', t. 353, it was seen afterwards lost sight of.

In 1874, through the kind assistance of Mr. R. MORGAN, I obtained bulbs which flowered strongly in 1875; and large importations have since been made by MESSRS. BARK and SODER, BULL, and others: so that the plant, which proves to have a much better constitution and to be more easy to cultivate than many of its congenerae, is not likely again to die out.

Though it may possibly grow and flower out of doors in the south-west of England, and even exist elsewhere, I should not recommend any one to treat it as a hardy plant—not only on account of its dislike to cold, but still more because of the very late period at which it commences growth.

Except L. Wallisiiannus, I know of no other Lily which is so late, both in coming up and in dying down; and it has another peculiarity which must be well remembered by those who wish to succeed in its culture—namely, the tendency which is shown by the young shoot to run for some distance in a horizontal direction before coming to the surface. This habit, though not invariable, is usual, and causes the loss or injury of many bulbs when grown in pots, if care is not taken to watch the first appearance of the shoot and direct it upwards, filling up with earth to the requisite level after it is well above ground; otherwise the shoots will descend against the side of the pot, and, after taking a turn round at the bottom and wasting their strength among the crooks, come up through a diminutive, or perhaps appear at last on the surface too late in the season and too exhausted to flower.

If care be taken not to overwater it, and to keep down aphides, I believe this Lily will succeed to perfection, planted out in a Camellia-house, where it will have plenty of space to travel about at will.

Though I have not yet seen more than three flowers on a single stem, I believe it is capable of producing far more; and as nothing is easier than to have plants flowering in succession from July to November, it must be considered equal, if not superior to L. auratum as an indoor Lily, and surpassing all others, except L. speciosum, which I still look on as the best of the genus.

Though the flowers vary in size from 6 inches up to a foot long, and in colour from creamy white to lemon-yellow and occasionally pink, the varieties are not, in a botanical point of view, very remarkable; and until I know more about their constancy and local distribution, I should be disinclined to separate any of them from the type, though WILLS, relying on characters which in this genus are of little value, described them as three species.

The seeds, which seem to take much longer in ripening than is the case with Lilies from higher latitudes, germinate quickly, like those of L. longiflorum, and produce leaflets at once, after the manner of L. candidum. I imagine that in four or five years the seedlings will attain a flowering size; but as offsets are made freely, both on the bulb and on the undergrowth stem, it is easy to increase the plant without so great an exercise of patience.

The plant here figured flowered in the garden of J. H. Ewes, Esq., at Colnebrook Park, Gloucestershire, in July 1876, and is the same from which a drawing was made by Mr. Fergus for the 'Gardener's Chronicle.'
LILIAM PARDALINUM.

THE CALIFORNIAN LILY.

L. pardalimum, var. peltatusflosum, Baker, loc. cit.
L. pardalimum, var. californicum, Hook. Lindley; Florist, 1873, p. 218, t. 33.
L. rosei, Regel, Gartenflora, t. 507, 1872.


Hab. California, Oregon, Utah. (Hartweg; Roes; Kellogg, &c.)

Balls large, white, producing 1-6 stalks or new bulbs annually, composed of thick, white, often articulated scales. Stem 3-6 feet high, stout, glabrous, green. Leaves 4-7 inches long, 1-2 brood, oblong lanceolate, generally in regular whorls of 3-12 or more, but on young plants often scattered; roots from 1 to 5, rare or less indistinct. Flowers 3-30, arranged in long pedicels in an open raceme. Perianth 3-5 inches long, red or crimson, with the lower part of the segments orange, spotted with purple, much reduced. Filaments a third shorter than the segments; style curved, twice as long as the ovary. Capsule an oblong, umbilicate at the apex.

THE fine Lily of which one variety is here figured, has been known for some years, having been collected by Hartweg in 1848, and received the MS. name of californicum from Dr. Lindley. As, however, no description was published until 1869, and a plant which had been previously named by Torrey cannot certainly be referred to this species, it will be best to keep it under Dr. Kellogg's name, by which it is most generally known both in America and England.

The varieties of this species are both numerous and puzzling; but after watching the growth of many plants from different sources, in my own garden and those of others, for four seasons, I am inclined to believe that not more than two or three are worthy of description, and that even these might so change their form, if removed to a different soil and climate, that it would be hard to recognize or distinguish them. Botanists when naming species from dried specimens, or after the comparison of a few plants, are often misled by characters which seem at the time good and distinct, but which prove too unstable to rely on; so that the confusion which prevailed among the various western species of American Lilies would hardly have been cleared up if it had not been for the assistance that has been derived from horticulture.

I cannot certainly say whether the plants named Brownii, Roesii, and Weidneri come properly under this species or not; but no living plant out of the thousands I have examined can be referred to other L. canadense or L. superbum; and though these species, or varieties of them, may extend west of the Rocky Mountains, yet I am inclined to think that all the Lilies with stoloniferous bulbs from the Pacific States are forms of L. pardalimum.

As I shall have to give another Plate of this species, I will leave the description of the different varieties for a future article, merely stating that the one figured here, which, I believe, should stand as var. californicum, may always be distinguished from the rest by the greater size and beauty, though smaller number, of its flowers, which rarely exceed three in number. I was informed by Hen. Rozzi, that it is found on the coast range, at a lower elevation than the other varieties, and that in the interior it is represented by a taller and many-flowered plant which he called L. phalorum.
LILium CAROLINIANUM.

THE SOUTHERN SWAMP-LILY.

L. carolinianum, Michaux, Flora, i. 197; Bot. Mag. t. 2280; Bot. Reg. t. 580; Nat. Gen. i. 222; Penn. Amer. Sept. i. 229;

Elliot, Bot. i. 358.


L. Michauxianum, Schult. El. Syst. vi. 255.


Bock. A Carolinat et Floridat et Lousianam (MICHAX ; BAHM ; NUTTALL).

Built like that of L. superbus. Scent 2-3 feet high, green, slender, globular. Leaves much fewer, shorter, and broader than in L. superbus, usually 1-8 inches long, 1-14 inch broad. Flowers 1, or rarely as many as 2, much resembling those of L. superbus, but with the segments less recurved, having a distinct appearance which is not easy to describe.

It is with much doubt that I ventured to treat this plant as a distinct species from L. superbus, to which it is undoubtedly closely allied; but whether as a species or as a more local variety, it has many characters by which it can be recognized with certainty; and as its geographical range is quite distinct from that of L. superbus, it has perhaps as good claims to specific rank as some other Lilies.

It appears to be always a dwarfer, more slender, and fewer-flowered plant; for Nuttall, who knew it well in its own country, says he never saw it with more than one flower in a wild state; and though in gardens it may attain two or three, it is far inferior to its northern cousin in size and strength.

Its leaves are very different also in appearance from those of L. superbus or any variety of L. candidum that I have seen; and there is about the whole plant a peculiar character, not to be expressed in words, which would strike the most casual observer.

The L. carolinianum of the New England botanists is without doubt the same plant common in Carolina and South Carolina. It is a native of the swamps and pine-barrens of the southern states of North America, being found from Carolina to Louisiana, though seldom in great abundance, and somewhat local in its distribution. It has frequently been introduced into cultivation, and as often lost, perhaps owing to its comparative tenderness, or on account of its inferiority to L. superbus. Indeed I was unable to procure living plants till last year, when my kind and valued correspondent Mr. C. J. Paine sent me a few bulbs which had been collected in Georgia. One of these flowered in my greenhouse in July, and another at Mr. Wilson's in August.

Except as a botanical variety, I do not think that the plant is likely to attract much notice, as, though the flowers are individually large and well colored, they are too few, and the plant is too tender to make it suitable for ordinary garden-decoration. It flowers at least a month later than any variety of L. superbus I have seen; and Mr. Elliott says that in the gardens of Charleston it is also a month or six weeks later than that species.

The plate was lithographed by Mr. French, from a drawing made by Mr. Noel Humphries, of Mr. Wilson's plant referred to above.
LILIUM CATESBAI.

CATESBY'S LILY.


L. spectabile, Salisb. Strp. Br. t. 5; no Linth.

L. carolinianum, Catesby, Cat. i. t. 58, nom. Michaux.


Dib. A Carolinæ or Mississipii. Carolinae et Mississippe (Michael Purse; Catesby).

Bulbus small, white, with narrow fragile scales, terminating in linear leaves 2-3 inches long, which fall off and leave scars below the plant flowers. Stem 1-2 feet high, erect, globous, bearing 15-20 narrow, pointed, twisted leaves, which are largest below, and become smaller upwards. Flowers, in all the specimens I have seen, solitary, 3-4 inches long, the segments with undulated edges sharply pointed at the top, and suddenly narrowed into a distinct linear claw, deeply channelled. Colour bright reddish yellow, spotted with purple. Filaments slender, 2-3 inches long; anthers small, with yellow pollen. Style a little longer than stamens, which are closely pressed to it, and not spreading. Capsule unknown to me.

I have figured this very distinct plant on the same plate as L. carolinianum, because it is a native of the same parts of the United States, and these two species, as I believe, are the only Lilies found there.

Though a not uncommon plant in many of the low sandy meadows, swamps, and pine-barrens of the southern States, from Carolina to Louisiana and Mississippi, it is little known in Europe, being of a very delicate constitution and unable to endure the cold of our climate. It has been frequently introduced and figured in various publications, and as often lost; so that, though it possesses considerable beauty, and is most distinct in appearance from any other Lily, it was, until recently, not to be found in any collection. What has been grown as L. Catesbaei in the Dutch and Belgian nurseries is, as I have before stated, a variety of L. daniurum, and has not the least resemblance to the true plant.

The structure of the bulb is very different from that of any other Lily, though it somewhat resembles that of L. engelbachii, as figured in the "Botanical Magazine," t. 4701. It is composed of thin, narrow, white scales, terminating in linear leaves which, as far as I can judge from cultivated plants, are produced in autumn, and grow through the whole winter.

As the leaves decay, leaving on their thickened base a distinct scar, others are pushed up from the centre of the bulb, until the plant is strong enough to flower. The stem then absorbs all the nourishment stored up in the bulb, which, when the seed is ripe, perishes, leaving only an offset; and this, in its turn, grows into a flowering bulb.

It can thus be hardly termed a true perennial, being, like L. tenuifolium, L. eucolor, and some others, nearly sure to perish after seeding. The season of flowering in America is from June to August, in different parts of the country.

As to its culture I can say little; the plants that I have grown, though living for two or three years, were very little root, and will, I am afraid, die without flowering. I much doubt whether it will be possible to grow it successfully or to keep it long in this country; and though the flower is of considerable beauty and interest, it is often paler in colour, and smaller in size, than represented in my Plate, which was made up from dried plants in the Kew Herbarium, from living ones in my own garden, and from a small, weak specimen in flower sent to Kew by Dr. Wallis, which, however, is the only flowering plant I have yet seen.
LILUM LONGIFLORUM.

THE LONG-FLOWERED LILY.


Var. TAKENWY (Hook.) est forma caule et floribus ad basin extra purpurae strictis.

Bulbs moderate, yellowyish, slightly flattened above, producing small bulbs freely at the upper part and base of the stem. Stem 1-2 feet high, smooth, glabrous. Leaves 20-40, scattered, bright green, 3-5 inches long, 1-2 inches wide. Flowers horizontal, usually solitary, but often 2-4 or 7, pure white, very sweet-scented. Perianth 5-8J inches long, tubular for half its length, opening at the mouth but not reflexed. Filaments white, 4-7 inches long; pollen yellow. Ovary and style equaling them in length, slightly declined. Capsule 14-2 inches long, bluntly angular.

This Long-flowered White Lily is a native of many parts of the coasts and islands of China, being found also in Japan, Loochoo, and Cochinchina, though perhaps not everywhere indigenous. It is also found, as I am informed by M. Swinnow, on the island of Formosa; but this plant, of which I have not as yet succeeded in getting living specimens, may be a distinct species, approaching in its very narrow leaves and the length of its flowers the Philippine Lily.

*L. longiflorum* is much cultivated in China, Japan, and India, and seems to endure a greater degree of heat than any other species, but is at the same time perfectly hardy in this country. Introduced as long ago as 1819 by the Royal Horticultural Society, it soon became common in Europe, and may now be had by the thousand at a very low price.

No Lily can be more strongly recommended for greenhouse decoration than this; for, though in some parts of England it may be grown well out of doors, it is apt to be injured by spring frosts, and rarely comes to perfection unless grown under glass.

The plant I have represented is the variety named *L. eozonis* by Cowper, and is as much rarer than the ordinary *L. longiflorum* as it is superior to it. Though rarely seen in this state of perfection, I have had it even finer, with no less than twenty flowers on three stems in a 7-inch pot.

For this fine variety I have to thank Lady Ramsay of Chelsea, who received it from Japan some years ago, and has cultivated it with extraordinary success, as will be admitted by any one who has, at the Chelsea flower-shows, seen her specimen plants with ten or twelve stems bearing from three to six flowers each.

The variety called *Takeiwha* is distinguished by a purplish tint on the stem and outside of the tube; and another variety, named *Wiihow* by M. Leichtlin, is also remarkable for the size and number of its flowers.

M. Duchartre, in his "Observations sur le genre Lis," p. 57, thinks that the varieties *eozonis* and *Takeiwha* may be distinguished by the angle formed by the flower with the stem, as well as by the relative size; but I have been unable to verify his observations in this respect by my own experience.
In the Anna® David's collection of Chinese plants I found some specimens gathered at Kinkiang, which appear to hold a somewhat intermediate position between L. longiflorum and L. Brownii, having a more open flower than the former, and being apparently tinted with purple outside. Dried specimens of lilies, however, are so difficult to determine with certainty, that I cannot be sure whether this plant is merely a variety or not.

From Mr. Pringle of Vermont I have received a variety sent to him from Japan, which is said to have yellow flowers; and in some Japanese native drawings a similar plant is represented; but I have not as yet had the good fortune to see it bloom in any European garden.

A form with white-margined leaves is occasionally introduced from Japan, where the art of inducing variegation in the foliage of plants is better understood than in Europe. Mr. Hocou tells me that he has never seen L. longiflorum growing wild in that country, though it is common in gardens and known by the name of "Teppa-Yuet," or Gun Lily, from its long, tubular flowers.

The seeds of this species, though seldom ripened in England, are much more rapid in their germination and growth than is the case with most lilies. I believe that, in three or four years at most, flowering bulbs will be produced if the young plants are properly treated.
LILY BULBIFERUM.

THE BULBIFEROUS LILY.

L. latifolium, Link, Enum. t. 521.
L. amabile, Miller, Dict. no. 4.
L. polyanthus, Berth. Flora. liv. 265.


Lilium bulbiferum, though well known both to botanists and gardeners, is a plant of rather limited range in the mountains of Central Europe, and is found, as far as I can discover, only in the eastern cantons of Switzerland, the Tyrol, and the lower Alps of Styria, Carinthia, Venetia, and Bavaria. From Mr. G. Maw, of Bath, I learn that the only localities where he has found it growing are Vals, in the Tyrol, and the Vals di Leiter, at the head of the Lago di Garda, where a very dark blood-red variety, rarely bulbiferum, and nearly glabrous, is found.

Mr. G. C. Churchill, whose knowledge of the flora of Central Europe is unsurpassed, tells me he believes that the localities in Western Switzerland and the Maritime Alps, given by authors for this plant, really refer to L. croceus or its variety Chinens. Grantham in his ‘Flora of Switzerland,’ 2nd edition, 1874, who is, I believe, a most trustworthy authority, gives only three localities for L. bulbiferum—Thurn, Litt, and Feldbrunnen, all of which are in the Grisons, while L. croceus is said to be found in the cantons of Uri, Ticeno, Valais, Neuchâtel, and St. Gall. The former plant ranges from about 1000 to 1000 feet elevation, and is usually found on the boulders of woods or among grass and bushes. Its supposed occurrence in a wild state in East Geldland is, I think, doubtful.

In cultivation this Lily has been known for centuries, being well described and figured in Parkinson’s ‘Paradise,’ and, though much more robust and larger than the wild plant, preserves the bulbiferous habit, brilliant colour, and peculiar aspect by which it is distinguished from its nearest allies. In a state of nature the bulbs are small, and the stem sometimes creeps underground, after the manner of L. daniouum, before coming to the surface; but in cultivation this habit is soon lost. I have never been able to examine a perfect capsule of this plant, which is said to be different in form from those of L. croceus and L. danouum, but I think it possible that an imperfect capsule, such as is sometimes produced if the bulbs are picked off, may have given rise to this statement.

The varieties of L. bulbiferum are not numerous; and the parentage of some that are supposed to have sprung from it is doubtful.

The Lily known as L. madelitum, which is the most floriferous of all this section (bearing as many as forty or fifty blooms), has no bulbs, but flowers at the same time as L. bulbiferum, fifteen to twenty days before L. croceus.
There is a curious little stunted plant, which I take to be *L. humile* of Miller, occasionally seen in gardens; this resembles *L. bulbiferum* in its principal characters, though much smaller and, as far as my experience goes, later in flower. Except as a curiosity, it is not worth cultivation.

*L. pubescens*, of Bournhara, is another plant sometimes seen on the Continent, and apparently a variety of *L. bulbiferum*, from which it differs by being more pubescent. What is known as *L. tuberosum incomparabile* is, in colour, one of the finest of Garden Lilies, and a most desirable plant. It is, perhaps, a hybrid between *L. bulbiferum* and *L. chrysas*, and will be figured with one of the varieties of the latter species.

The cultivation of *L. bulbiferum* is extremely simple, as it succeeds well in the ordinary soil of the garden, and is rapidly increased by the bulblets, which, if planted in good soil, come to a flowering size in two or three years.

The plant figured flowered in my garden in June 1875, and was selected as showing the typical character of the species better than one with a large number of flowers.
LILIMUM HUMBOLDTI.

HUMBOLDT'S LILY.


Hab. California, montibus Sierra Nevada, 2500-3500 pedum altitudine (Borag. et Kellogg).


Bulb very large, purplish in colour, composed of thick fleshy scales rising from a broad axis, the growth of which is lateral and downward. Stems produced from the base of the new growth, 4-6 feet high, glabrous or puberulous, spotted or tinged with purplish. Leaves in whorls of 8-12, oblong-ovate, 4-5 inches long, 9-12 inches broad. Scorned, sometimes exists on the nerves beneath and waved at the edge. Flowers 6-10, in an open panicle; pedicels upright or drooping, 3-6 inches long. Peduncle 3-4 inches long, orange-yellow with purple spots, sometimes occluded, and surrounded with an auricle of paler tint. Filaments 14-2 inches long, anthers 6-8 lines; pollen red. Capsule obovate, nearly angled like that of L. Martagon.

The very fine species of Lily was first discovered by Mr. B. Bown. at the centenary of Humboldt's birthday in 1879, in the Sierra Nevada region in California. He named it Liliimm Humboldtii for this reason, and not, as has been wrongly stated, because it was found in Humboldt County. He sent a quantity of bulbs to Mr. Leichtlin, who, with his usual generosity, distributed them to many of the botanic and private gardens in Europe. He was himself the first in this, as in many other instances, to flower the plant in Europe; and though not so fine as it has been seen since, its beauty was at once recognized by all lovers of Lilies. Large importations were made of this plant in 1872 and 1873, so that it has now become quite common.

Dr. Blandamer, in 'The Garden' for Jan. 3, 1874, has given so good an account of its native habit, that I will quote him verbatim:—"This large species has apparently a far less wide range than L. Washingtonianum. It occurs mainly on the more elevated portions of the foot hills of the Sierras, from 2500 to nearly 3300 feet altitude, evidently requiring a greater amount of heat to develop its full beauty than the others. The soils in which its bulb is found are of a rather compact character, consisting of clay with an admixture of broken rocks and a small portion of vegetable mould. Growing in open park-land, or land entirely cleared off, and therefore exposed to a dry and evaporating air, we find its bulb also at a considerable depth. The aerial bulb is very large and strongly built; its outer scales are largest, imbricately, lanceolate, tinged with purple and very fleshy, well calculated to hold a large supply of moisture. A short time ago this species was also found by Mr. H. Harmer on the Island of Santa Rosa, opposite Santa Barbara. As far as I know, it has not yet been found on any part of the coast ranges. The plant from Santa-Rosa Island differs but very slightly from that on the foot hills of the Sierras. Its leaves are of a brighter green, narrower; and its whorls are denser and more regular, while the leaves of plants from the Sierras are rather subulate, and terminate with a blunt point. The former is exposed to sea-breezes and fogs, the latter to a dry air. The bulbs
from Santa Rosa do far better with us at San Francisco than those from the Sierras; the reason is plain. The figure in Van Houtte’s ‘Flora des Serres,’ vol. xix. t. 1573, represents the island form as truthfully as a representation can be made.”

The bulb of Lilium Humboldtii is very remarkable, not only on account of its great size, but because of its peculiar shape and structure, which has been well described by Prof. Duchartre, in his ‘Observations sur le genre Lilium,’ p. 81. Like that of L. Washingtonianum, its scales do not spring from a central base, but from a lateral descending axis, which, growing outwards and downwards every year, throws up its stems always on one side, and, decaying slowly on the opposite side, forms by degrees an elongated mass, quite different from the bulb of any Old-World Lily. Whether this peculiar structure is in any way influenced by its native soil and climate I cannot say; but it is curious that the only two species which in any way resemble it in bulb-characters, viz. L. Washingtonianum and L. colubrinus, are from the Pacific slope of North America.

The colour of the young stem and leaves, like that of the bulb, is purplish, and the growth is very rapid. This species seems to succeed well in England, both out of doors and in pots, and, perhaps owing to its large and solid bulb, suffers much less from importation than the majority of Lilies. It appears to like a peaty soil; and though the foliage is sometimes much injured by cold winds or drought, the bulbs rarely decay.

With regard to the varieties of Lilium Humboldtii, I can say, as I shall have to say of many other Lilies, that if I had only seen a few of the most distinct, I should readily allow that they were worthy of names and descriptions; but having seen and cultivated a large number, I can see no limit by which to define them. For this reason I do not think that the variety named by KELLOGG scoliatus, from Santa Rosa Island, can be treated as a distinct plant, though Mr. Roezli thinks that it is more floriferous than the others, producing as many as 20-40 flowers, while the common sort has no more than 20-25 and more usually only 13-19; but see the remarks in Dr. Kellogg’s paper.

The size, colour, spot, and arrangement of the flowers vary extremely. In some plants the flowers stand out almost at right angles to the stem; in others, as shown on the Plate, they droop at an angle of 45°; in others the pedicels are inclined upwards; and the size and form of individual flowers also vary considerably.

I have received it from various parts of California, from the Napa valley, and from as far south as Santa Barbara; but Mr. Roezli tells me that the Lily imported as a species from Mexico, and which proved to be a variety of Humboldtii, is really from San Blas.

For the beautiful specimen here figured, which represents the oscillated variety, I have to thank my friend Mr. Wilson, in whose garden at Heatherbank it flowered in July 1876. The single flowers of other varieties are from my own garden.
LILYUM COLUMBIANUM.

THE OREGON LILY.


L. *Stegel*, Nat. All. M86.

**Bulbus columbiae, perennial, allies, specious, each bulb, lanceolate.** Open 2-5-petals, globosus, viridos, glabros. Folias petros, in verticillis 4-6-bilatis disposita, superfis morea, olivaceo-lutescentia, acuta, 14-3 poll. longa, radios 5-9 mm. longa. Flores 2-6, umbellati, pedicelli glandulosi, 2-6 poll. longi, sphaero-cordatis, folia reducuntur basi brevissimi, inferum lutescenti. Perianthiun 1-5 poll. hase, punctatum, segmentis lanceolatis, medios 4-6 lin. longi, stami reflexi, atque epigyni purpureo-punctatis, brevibus glabris leviter curredentia. Spermata perianthi excrebrescentia, antica 2-3 lin. longa. Style viscinum vis superum. Capsula oblonga, 1-3 poll. longa.

**B. Oregon (Loom; Rock).** Cascades Mountains. Columbia illiustris (Loom, Douglas).

Bulb ovati; perennium, compressus, deorsum, petaloides, columna, which apparently grow on one side only, as in *L. grandiflorum* and *L. Washingtonianum*. Soma 1-3 poll. longi, arciforme, 5-9 lin. longi. Flores 5-6, or more, square, in an umbel on shorter subsessil pedicelis, 2-6 poll. longi, dropp- ing at the end. Periacle 1-2 poll. longi, concolor, punctato, petali. Spermata viscinum, reflexum, reflexum, 2-3 poll. longi, viscinum, visinum. Style viscinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visinum, visi

**The Oregon Lily has been for some time in herbaria, and by most botanists considered a variety of *L. grandiflorum*; but there can, I think, be no reasonable doubt that it is quite distinct from that plant, and from any other—not so much on account of its flowers as because of its bulb, which resembles that of no other American species.**

It is a native of the coast and interior of the State of Oregon, Washington Territory, and British Columbia, from about 40° to 50° N. latitude, and has been gathered by many explorers of those regions. I learn from Mr. B. Broom that it is found on dry sandy plains, and on the mountains up to 5000-6000 feet elevation, where the climate in winter is very severe, and where rattle-snakes were so abundant in autumn that it was a work of much danger to dig up the bulbs.

It was first sent to Europe in 1873 or 1875 by Mr. Hanson of New York, who gave it the name of *columbianum*, because it was found on the banks of the Columbia river; and was described by Mr. Backer from a plant which flowered in Henry Moreau's garden in 1874.

In referring the plant known as *L. grandiflorus parviflorus*, Hook., to this species, I am guided by numerous specimens in the Herbarium at New York, collected by Lyall and Dawson, the bulbs of which even in a dry state can be distinctly recognized; but no botanist who had not seen the species in a living state could have separated it specifically with any certainty, as the whole plant, in spite of the whole plant, resembles weak or stunted varieties of *L. parviflorum* or *L. grandiflorum*. The bulbs, however, is not stoloniferous as in those species, but has more affinity to that of *L. grandiflorum*, of which the plant is perhaps a miniature northern representative.

In this country it grows perfectly hardy, and is easy to cultivate in the same soil and situation which suits *L. parviflorum*. It varies considerably in the size and shape of the leaves (which are usually whorled, but sometimes scattered), and in the form and colour of the flowers; but out of a large number of bulbs which were kindly sent me by Mr. Hanson, not one presented any notable difference from the type, which is well shown in my plate. The plant here figured flowered in July 1872 at Mr. Backer's nursery in London; but as I was not then quite sure about its identity, I waited until I knew more about the species before writing on it.

The two varieties, of which single flowers are shown, were grown in my own garden in 1877, and produced seed freely.
LILIJUM SPECIOSUM.

THE LANCE-LEAVED LILY.


L. flaviflora, Maxim., Pflanzen, Part. Mag. v. 267, non Hort. et Thunb.


Bulbus perennialis, glaber, brunneus or purpulatus, 2-4 inches in diameter, composed of thick lanceolate scales. Stems 2-5 feet, or even more, high, rigid, erect, glabrous, papyllis, green or purpulatus. Leaves 30-30 or more, ovato or ovato-lanceolate, 5-8 inches long, 1-2 inches broad, below the middle, bright green, glabrescent, distinctly veined with 1-2 ribs, rounded at the base to a short petiole, which is compressed to the stem; narrowed gradually from the middle to an acute or acuminate point, the upper ones lanceolate, 6-9 lines broad, 6-7-nerve. Flowers 3-20 or more, generally about 6, in a broad subependent raceme. Peduncles bracteate, rigid, creato-petulato, the lowest 3-8 inches long, the upper one shorter. Perianth 3-5 inches long, the divisions spreading from near the base, the points much reflexed, the outer divisions 12-21 lines wide below the middle, the inner broader. The lower half of the corolla covered with mixed papillae, which towards the throat of the flower are 2-5 lines long. Colour very variable, but in the typical form white, even suffused and copiously spotted with bright pink. Filaments 2-4 inches long, widely divergent; anther 9-12 lines long; pollen deep red or chocolate; ovary in such long; style 14-21 inches, slender, slightly deccurrent. Capsule 2 inches long, oblong-oblonga, obtusely angled, subulate at the apex.

THOUGH this plant is usually supposed to be a native of Japan, I learn from Prof. Maximowicz that it is never found in that country except in gardens, and is said by the Japanese to come from the Corea, on which account they call it "Kwai-pei," Corea Lily. Truncatus says that the white form is from the Loochoo archipelago; but I do not think it is a native of those islands.

The only locality from which it has been recorded as an indigenous plant is Kinkiang, a town on the Yang-tze-kiang river, in lat. 29° 56' N., long. 116° E., where it was discovered by Dr. Hanse. The Annales Davidi informs me that he found it sparingly near the same town in valleys of moderate elevation; and the dried specimens in his herbarium, though much dwarfer and smaller-flowered than the cultivated plants, agree with them perfectly in general character. It was first introduced by Yee Sumson, who sent it to the Botanic Gardens of Ghent in 1832, where it flowered, and was described and figured in several of the botanical journals.

So beautiful a plant was not long in becoming a general favourite throughout Europe, and, being found easy to grow and propagate, has held its place in popular favour when Lilies were little cared for, and is now cultivated for sale on a very large scale in the bulb-gardens of Holland and Belgium, under the erroneous name of L. flaviflora.

Of its culture I know but little, having given a full description of the proper treatment of Lilium elatum, which is equally applicable to this species. Although its constitution is not so delicate, it is generally seen to greatest perfection under glass, and has degenerated considerably in the climate of Holland, where it is treated as an outdoor plant. It is increased without difficulty by means of scales, offsets, and seeds, though the latter are rarely matured in the open air of this country.

The varieties of L. speciosum are numerous, and have mostly originated in Japan, as is proved by the native drawings on silk often sent home from that country. They have been carefully studied by Dr. Maxwells, who
has published the results of his examination in the 'Gardener's Chronicle,' 1872, p. 1322, and arranged them in the following table:


B. S. [species] not flaviflora.

This arrangement, though not including some of the slight varieties now cultivated, is a very good one, and will enable any one to distinguish them without difficulty. As, however, a more detailed description is necessary, I will say a few words about them separately.

1. L. [species] speciosum, Var. Kewiflora, B. M. 3785—atro magniflora Hort.; no. 6 of Dr. Masters’s table. This is supposed by Mr. Wilson and others to be the original variety introduced by Van Sleenol, and is superior to the majority of those commonly grown. It may be distinguished by the following marks, as pointed out by Mr. Wilson—S. nutescens somewhat shorter than the average, flowers-buds shorter, segments broader, more perfectly and evenly recurved, having a distinct white margin on a bright rose-pink ground, and very richly coloured spots. Time of flowering rather later than usual. This variety is largely grown at the Knap-Hill Nursery, Woking, where it may be seen in perfection, and thrives in the poorest soil which so well suits the Rhodoindicus for which that nursery is celebrated.

2. L. [species] flaviflora, Paxil. Mag. v. p. 91, is much like this, but the flowers are not so brightly, distinctly, or evenly coloured, or so perfectly formed. It is probably a somewhat deteriorated form.

3. L. [species] punctatum, Paxil. Mag. v. p. 267; albiflora, Bot. Mag. 3785. A lovely variety; pure white, spotted with delicate rose. This was introduced by Van Sleenol at the same time as the first, and is now common.

4. L. [species] vestale, Masters, loc. cit (=ammensa, Zucc. et Spach; L. Hemsleyi, Merr. Mém. Acad. Roy. Botix. Fel. 1834), is a pure white-flowered form with green stem and long, much reflexed, wavy petals; no. 8 of Dr. Masters’s table. It was also introduced by Van Sleenol, and is as much superior to the common white form as speciosum erectum is to renseum.

5. L. [species] Kewiflora, Dendroic, Baker, J. L. S. 1874, p. 204, is a white variety, having the backs of the segments strongly tinged with green; but I am doubtful whether it can be separated from the last form.

6. L. [species] rubrum, var. 3 of Dr. Masters’s table, is the common one grown in Holland. A fine variety, called rubrum multiflorus, which I have had from Messrs. A. H. Beever and Son., comes in here. Its flowers are large, well-formed, and very brightly coloured. L. tuberose is another good form of this type, which I have received from America.

7. L. [species] albus, no. 4 of Dr. Masters’s table, is the white variety commonly grown. It is much inferior in size and beauty to speciosum erectum and punctatum, and is generally of a weaker habit and smaller size than other varieties.

The varieties no. 1 and 2 of Dr. Masters’s list, usually called cornubiformis rubrum and albus in catalogues, are simply monstrations, having their stems much flattened out, and a number of flowers which are very inferior in size and beauty.

Besides these there are many other so-called varieties in the Dutch and Belgian nurseries, which are for the most part quite unworthy of distinctive names. As a rule it will be found that all bulbs newly imported from Japan, and grown under glass, produce such better flowers than those long cultivated in Europe.

The plant figured here is a fine specimen of the typical variety speciosum erectum, with single flowers of punctatum and vestale, all of which flowered in my garden in August 1876.
LILY CANADENSE

THE CANADA LILY.

*L. canadense* Linn. Sy. 455; Bot. Mag. t. 890 et 884; Bory, Hist. t. 12; Flora des Saisons t. 1174; A. Gray, Man. p. 532.


*L. penduliferum* DC. in Bot. Ed. t. 183.

*L. pendulum* Spc. Mon. 23.


Hab. Amer. borealis orientalis ad Georgiam.

Bulb annually produced at the end of long or short stolons, composed of thick, white, fragrant scales. Stem 1½-4 feet high, erect, green, tough, glabrous. Leaves oblongacut, 5-7-fid, glabrous, usually in whorls of 5-12, or in some cases scattered on the stem. Flowers 1 or several in a cluster or corymb, on pedicle 6-9 inches long, usually baccellate. Perianth 2-2½ inches long, the divisions more or less spreading and recurved, varying from yellow to bright red, with numerous purplish spots. Filaments 4-½ inch long; anthers 4-6 lines; pollen orange. Style straight, twice as long as the ovary. Capsule about 1½ inch long, rounded at the top, with very obscure angles.

The Canada Lily is perhaps the best-known of all the American species, and has been in cultivation since the time of Parkinson, who, in his delightful "Paradise," or Garden of Pleasant Flowers," published two and a half centuries ago, describes it under the name of *Lilium martagon canadense martagon*. It is one of the commonest species all through the eastern states, from Canada to the mountains of Georgia, and extends as far west as the Mississippi river, and probably at a higher altitude even further. According to Mr. Hasson it is also found in the Italian territory; but I have seen no specimens of the typical plant from the Rocky Mountains or Pacific States, and I am inclined to think that it is replaced there by *L. pendulifera*.

It grows in gravelly flats, sandy meadows, and marshy places, but not in such wet ground as *L. superbum*, and is an extremely variable plant both in bulb and flower. There are several well-marked varieties, among which the following are the most conspicuous. *L. canadense rubrum*, figured in Bot. Mag. pl. 888, is usually a small and few-flowered plant, and is found, as Mr. Hasson tells me, in dry meadows along the Hudson river. *L. canadense floreum*, as figured in my plate, fig. 3, is also a small plant, with the flowers of an Indian-yellow ground-colour, and the divisions of the perianth too much reflexed; it is common in all the eastern States.

*L. canadense superbum*, fig. 1 on my plate, is almost intermediate between the typical *L. canadense* and *L. superbum*, which, according to Provo, A. Gray, passes into it. It is a larger, more floriferous, and finer plant, bearing from 3 to 7 or 8 flowers on long pedicels. The perianth-segments in this plant are much more reflexed, but never, as far as I have seen, show the green patches at their base, which distinguishes *L. superbum*. The bulbs of this variety (see fig. 1) are usually much larger and more compact than in the others, and, I believe, grow in wetter ground. Mr. Hasson tells me he has found it at Green Bay, Wisconsin, and elsewhere. In Mr. Max's garden I observed a very similar form which had been sent to him from Hayeville, Ontario, and in the herbarium of the Jardin des Plantes at Paris is a specimen of this type from Cove Valley, Pennsylvania, with pedicels a foot long.

The curiosus narrow-petalled variety (fig. 2) is from Long Island, New York, where Mr. Hasson tells me it is abundant; and its bulb, which I have shown in fig. 2, is also very different from the other, and more resembles the bulbs of the typical form. I have no doubt many other well-marked varieties have been and will be found; but I do not think they need ever be confused with *L. perennum* or *L. columbianum*. Of the plant described by Provo, Ween in the "Proceedings of the American Academy," 1868, p. 166, as *L. Walkeri", and considered by Mr. Baker a variety of *L. canadense*, I know nothing, and should rather take it to be a form of *L. perennum*, which, though placed under *L. canadense* by the same author, is, as I think I have shown in a recent number of this work, an entirely distinct species.
In studying the varieties of the American bulbous Lilies it is useless to rely on the characters shown by a few specimens. The more I see of them the wider my views as to the constancy of so-called species become; so that without a more minute knowledge than we now possess of the climate, soil, situation, and other causes regulating their distribution, it will be useless to lay down fixed rules as to their classification.

The culture of *L. candidum* does not at present seem to be very well understood in this country. Though it is of course perfectly hardy, and often flowers freely for a year or two, it does not seem to be able to establish itself or to increase in this country. It may be that our springs and summers are too cold, and our autumns and winters too wet, for this as for many other plants of the United States; or, like some other Lilies, it may be not truly perennial, and therefore dies naturally, after flowering and seeding abundantly.

The seed germinates very slowly, usually after the expiration of eighteen months from the time of ripening; and the young plants when up are slow of growth and difficult to keep.

The four varieties figured on my Plate, for which I am indebted to my excellent correspondents Messrs. Pringles and Hannon, flowered in my garden in July and August 1876.
LILIUM AURATUM.

THE GOLDEN-RAYED LILY.


L. speciosum imperiale, Hort. Siebold.


Ballbus 2-4 lin. bracteis, globosos vel fuscis, compositis de multis thick, cuneo-compressos, curvatis, neofloribus valls, pellibus; brown obsoletis, but white or yellowish white within. Stampa 2-4. ca in well-grown guineas eachsone in wundatir 8-10 feet high, rigid, veet, purplish green, twete, globewss. Leaves about 30, but varying considerably in number, spreading or slightly curved, the largest 6-9 inches long, 9-15 inches broad below the middle, similar to those of L. speciosum in colour and texture, but usually narrower, with 5 or sometimes 7 distinct ribs, slightly narrowed at the base to a short distinct pedicle, narrowed gradually from the middle to an acuminate point. Flowers in wild specimens from 1 to 10, but in cultivation sometimes as many as 30 to 40 on a stem; the pedicels rigidly erect-patent, lanceo-oblong, 3-4 inches long. Pedicel spreading, the point of the segments more or less reflexed; the divisions 5-7 inches long; the outer 15-18 linea broad near the middle. The colour is, in the ordinary form, white, with a distinct central band of yellow, and numerous pink, purple, or crimson spots; but there are some varieties with a pink or reddish crimson band, and others with a very pale lemon band, others almost pure white; the lower part of the segments covered with papillae, and a green seed or nectar at the back. Flower when expanded 8-10 inches across, strongly and pleasantly scented. Filaments 3-5 inches long; anther 1 inch; pollen yellowish or chocolate-colored; ovary 12-16 inches long; style 3-4 inches. Capsule 2-3 inches long, broader towards the apex. Seeds yellowish brown.

The arrival of this splendid plant from Japan probably created a greater sensation in England than almost any introduction of recent years, and has perhaps done more to attract the attention of gardeners to this long neglected but beautiful genus than any thing else. Though L. speciosum is considered by some to be the queen of Lilies, I must give my preference to auratum, a thriving plant of which is, to my eye, the most beautiful floral production that can be seen.

Though one of the commonest wild flowers in many parts of Japan, the golden-rayed lily was not introduced (and was indeed hardly spoken of) in Europe until the year 1850 or 1861, when it was first sent over in a living state. This was not, however, the first attempt made to introduce it, as the celebrated naturalist von Siebold had sent it as far back as 1820 to the Botanic Gardens at Ghent. None of these plants, however, arrived alive; so that until the opening of the port of Yokohama to European commerce in 1859 it still remained unknown.

In 1861, however, it was introduced by no less than four different persons. Dr. Von Siebold sent it again to Belgium under the name of L. speciosum imperiale. Mr. Gordon Dexter sent it to America, where it was exhibited at a show of the Massachusetts Horticultural Society in July 1862, and named Lilium Dexteri by Mr. Harvy. Mr. R. Fortunec and the late Mr. John Gould Vatton, both of whom were travelling in the East in search of plants, were not long in getting hold of this one; and a good number were dispatched to London, where they arrived in fair condition. Messrs. Vatton and Sons, of Chelsea, knowing their value, bought nearly all that were offered for sale, and exhibited the first flowers that were produced in 1862, when it was named by Dr. Loddiges Lilium auratum.
Since then millions of bulbs have been imported, and though the loss from careless packing, bad cultivation, and the natural delicacy of the plant has been something terrible, there is hardly a garden, large or small, where this plant is not grown and valued. In its own country it is abundant, growing almost by acres in some of the woods, and in a light moist soil on the hills near Yokohama. It is called Yuna-Juri, or Hill-Lily, by the Japanese, who, though great lovers of Lilies, do not, according to Mr. Kramer, one of the principal exporters in Japan, grow this species in their gardens so largely as some others.

The bulbs are collected from the environs of Yokohama and other places about the end of October in great quantities, and packed in boxes of 200 or 300 to send to Europe. If the season is wet, the bulbs do not properly ripened, or the cases exposed to much heat on the voyage, as is too often the case, the majority arrive rotten; and I grudge to say that hundreds of cases are lost almost every year from one or other of these causes.

A new way of packing, however, has now been discovered, by which the bulbs arrive in England almost as fresh as when they were taken up. Many thousands have been sold at Messrs. Sherwell's rooms during recent winters in splendid order, and at a price so low that there can hardly be much profit to the exporters. Formerly they were packed in a loose yellowish earth, which filled up the space between the bulbs, and kept them firm in the box; but now each bulb is enclosed separately in a ball of wood or clay, which hardens round it, and, by keeping out the air, preserves it in a perfectly firm and fresh state.

Still there is something in the constitution of this plant which seems to make it very liable to decay and death; and the number of bulbs that perish annually in England would hardly be believed. In a dry season like 1874 they sometimes go off quite suddenly, the leaves first falling, and the stem and flower-buds withering, without any apparent cause. Out of a batch of 20 or 50 plants perhaps only 3 or 4 will remain alive two years after their arrival in England; but these, if well managed, will go on improving and increasing till they produce magnificent specimens. The cause of this disease does not seem to be yet fully understood; but the most skilful gardeners have suffered from it; and though in some favoured spots the Golden-royed Lily will probably live and thrive permanently, it does not seem to find the soil and climate of England generally congenial to it. About its hardness, however, there is not a doubt; and as there is no difficulty in raising it in large quantities from seeds or scales, I do not think we are likely to run short of it even if the annual supplies from Japan fail in full.

With proper treatment and attention I believe the Golden-royed Lily can be grown to greater perfection in pots than in the open ground; and though this is of course the most troublesome method, yet the plant is so well suited to the decoration of conservatories and halls that it is the one chosen by most people.

The treatment that I have found by experience the most successful is as follows:—On receipt of the bulbs, which should be purchased early in the winter (home-grown ones being in most cases to be preferred to imported ones), they should be potted singly in pots from 5 to 8 inches in diameter, according to their size. The pots must be well drained, and filled about half-full of a mixture of loose fibrous pot and soft yellow loam, well mixed with coarse silver sand. The bulb should then be put in and covered with the same compost to within 1 or 2 inches of the rim. The pots should then be plunged in ashes, peat-moss, or some similar substances, in a cold frame, orchid-house, or shed where the frost cannot enter, and covered up with leaves or straw. In from two to three months they will begin to shoot, and should then be uncovered, and placed in a light and airy place, not too much exposed to the direct rays of the sun. Water must be given sparingly at first; but when the stems are well advanced copious supplies are necessary; and the soil from first to last must never be allowed to get hot or dry. Aphides, which are very fond of and injurious to the young growth of Lilies, must be carefully sought for and destroyed, or they will injure the flowers. As the stems begin to throw out roots a good surface-dressing of rough peat must be put on; and very weak liquid manure may be occasionally given, if the plants are well rooted and growing freely; otherwise it does harm, and it must never be used too freely.

During the growing-season the plants should be kept in a cool greenhouse, and well syringed at night, or may be plunged out of doors in a sheltered and half-shaded position, where they will bloom later. If they grow very strong, they may be shifted into larger pots without injury about May or June; and when once bulbs are well rooted they thrive better in large pots than in small ones, as the soil is kept in a more regular state of moisture. If, however, a number of imported bulbs are potted together in one pot, they will probably flower at different times, and so spoil the effect.

The greatest success is usually obtained with bulbs that have been grown two or three years in England:

* I am informed by Mr. Hove that the great foreign demand for *L. auratum* has so diminished the number of wild plants that it is now cultivated by small farmers to supply the market.
and those frequently attain a height of 5 to 7 feet, and produce as many as 20 to 50 or even more flowers on a single stem. They vary much in size and colour, as well as in habit—some plants bearing flowers only at the top of the stem, and others nearly halfway down it.

After blooming, the pots must by no means be neglected or allowed to become dry, as they so often are. Their success in the ensuing years depends in a great measure on the roots being alive for as long a period as possible; and this is only to be ensured by careful watering. If they are repotted annually, which is the practice of many growers, it should be done as soon as the stems have completely withered, and with as little disturbance to the roots as possible. The stem, however, should always be cut off close to the bulb, removing with it the mass of roots, which, having fulfilled their function of nourishing it during the growing-season, are now useless. A fresh top-dressing being put in, the pots should be returned to their winter quarters, and kept in a state of gentle moisture, neither dry nor wet, until the new growth again appears.

As regards the conditions under which this plant succeeds best out of doors I cannot do better than refer my readers to an account of the garden of James McIvor, Esq., at Outlands Park, Weybridge, which was published in the 'Gardener's Chronicle' for December 18, 1875.

The extraordinary success which has been obtained here is in my experience unequalled, and is, I think, due principally to the soil and situation of Mr. McIvor's garden, which slopes gently to the north, and is well sheltered by trees from wind. The soil is very light, but always moist below; and the Lilies are all planted on the edges of rhododendron-beds, where they are protected from spring frosts and the soil is sheltered from the sun. Here they attain a height of 6 to 12 feet, bearing commonly 20 to 40 flowers on a single stem, and blooming at various times from July till the end of October, the middle of August being the time when they are usually seen in the greatest perfection.

*Lilium auratum* ripens seed freely under favourable conditions, and may be propagated in this manner with moderate care, though the seed often lies for more than a year before germinating. I have not yet been able to ascertain the reason why seeds ripened and sown at the same time vary so remarkably in the period of germination. A few usually come up in the first season, and the majority in the second; but some lie dormant for as much as thirty months.

The plant which I have figured is by no means so fine as is often seen, either in the number or size of its flowers; but a Plate of double this size would not contain a really large specimen.

The varieties are so numerous that hardly two plants in fifty will be exactly alike; but no striking departure from the typical form exists.

The plant known as *L. rubroinflavum* is an extremely scarce and beautiful variety, which I hope to figure in a future Plate. It has the yellow band replaced on the upper part of the petal by more or less deep red, in rare cases a distinct crimson band appearing; much more frequently, however, the red tint is pale, and fades after the flower has been out a few days.

A somewhat similar and even more beautiful variety was figured in the 'Floral Magazine' for November 1876, under the name of *L. auratum cruentum*, differing from the last in the crimson band, which in the centre is extremely dark, being continued to the very base of the petal.
LILIJUM ELEGANS.

THUNBERG'S LILY.


Baker, Gen. Chron. 1871; Duchartre, Obs. 32.


Bulb small, resembling that of L. croceum and L. bulbiferum, but smaller. Stem 8 inches to 2½ feet high. Extern, rigid, velutine, slightly clothed with cuticular pubescence, but not so much as L. bulbiferum. Leaves very varied, both in number, size, and shape, but usually from 30-40 in number, and about 3-4 inches long by ½-1 inch broad. Flowers umbeliferous, from one to twelve or more, very varied in colour and size, ranging from pale orange to dark reddish crimson, and more or less spotted with brown, black, and red. Petals dilated spreading from the base, 3-4 inches long, 1½-2 inches broad, more or less downy on the back, and sometimes deeply revedged, papillate in the throat. Ovary 8-12 lines long. Style 1½-1½ inch. Filaments 3-3½ inches long; anthers 4-4½ lines; pollen red or yellow. Capsule usually distinguishable from those of allied species by its flat and not umbilicate top.

THE plant which is here described under the name of L. elegans is one that has been long cultivated and well known by the name of L. Thunbergianum; but as, in Mr. Baker's opinion, the description and plate published by Thunberg of L. elegans, as well as the type specimens in his herbarium, can be referred with certainty to this species, the laws of scientific nomenclature compel the change. I do this with the least regret, as the name of L. Thunbergianum is a stammering-block to many, and the distinguished Swede who bore this name has had so many other Japanese plants named after him that there is no fear of his researches being forgotten.

This plant was treated by Mr. Baker in his first review of the genus ('Gardener's Chronicle,' 1871) as a subspecies of L. bulbiferum; and this opinion, though modified afterwards, is well worthy of attention from the fact that Thunberg himself was not one of the many who have been so prone to the practice of over-estimating himself. As, however, it has developed so many varieties very distinct in appearance from L. bulbiferum or L. croceum, and is so widely separated in its geographical range from either of them, I think that, for all practical purposes, it is much better to consider it a distinct species.

Lilium elegans was first made known in Europe by Thunberg, in a paper published in the 'Memoires' of the St. Petersburg Academy of Sciences in 1811, called "Examen Lilium Japonicum," but it was not introduced until 1833 or 1834, when Von Siebold sent it to Ghent with L. speciosissimum and others.

Being an extremely variable plant both in form and colour, and one that has been long cultivated in Japan, a host of varieties have been imported from time to time, and have been described by several botanists as distinct species. As, however, no good characters can be found to distinguish them, and many of the garden names have been applied without description to the same or different varieties, I shall only give a list of those which seem to have the most marked features.
I have studied the numerous forms of Orange Lilies cultivated in the gardens of England and the Continent, with much care, and have to thank especially Mr. Wilson, Mr. J. H. Kearnley, of Haarlem, and Mr. F. Baker, of King Street, Covent Garden, for the facilities they have given me in visiting and examining their large and well-grown collections; but though the paper by Messrs. Baker and Dyce in the 'Gardener's Chronicle,' 1874, p. 1356, founded on a study of Mr. Baker's collection, names and describes a good many of them, I am unable to follow it in all respects. The fact is, that the Japanese Orange Lilies have been crossed extensively with the European ones, and it is therefore impossible to refer many of the garden forms to either species. One thing, however, I think probable is, that the forms grown under the name of *L. decorum* have, with one exception, nothing to do with the true *L. decorum* of Siberia (which has a very different bulb), but are more likely hybrids between *L. elegans* and *L. coeruleum*.

The varieties of *L. elegans* which I think most distinct and worthy of notice are as follows:

1. *L. elegans*, as figured in the 'Botanical Register,' vol. xxv. t. 38. 1-2 feet in height, with broad leaves, downy stem, and unsqueted flowers of a deep reddish orange. This may be considered the type of the species.

2. *L. elegans*, var. bioster, Moore, Floral Magazine, t. 104. Under a foot high. Stem glabrous, leaves crowded, flowers scarlet towards the edge, orange in the middle of the petals, with few spots.

3. *L. elegans*, var. elatum, Baker and Dyce (L. *Thanbergium aureum agro-montanum*, Flore des Serres, t. 1977, and grown under this name in the Dutch and Belgian gardens). The dwarfest form of all, under a foot high, with two or three, large, apricot-coloured flowers freely spotted with black. A most desirable and showy form.

4. *L. elegans*, var. Alice Wilson (hort. Wilson). Reminds the last in colour, but brighter, with fewer spots, and considerably taller. A very pretty variety, which I have only seen in Mr. Wilson's garden.

5. *L. elegans*, var. songarica, Lindl. Bot. Reg. 32, t. 50 (thymidulae hort.). A fine, dark-red variety, of moderate height, with open segments of a deep red colour, moderately spotted, but not so dark as the next.


7. *L. elegans*, var. autumna, Knuth, Enum. iv. 260; Flore des Serres, t. 657 (=fugens, Morren, Spec. Nov. p. 79); Lem. Ill. Hort. t. 422. The latest variety of all, coming into flower a fortnight after the others have done blooming, and taller than any of the others, quite glabrous, and bearing 4-7 flowers, which are clear red without spots.

8. *L. elegans*, var. postica, Moore, Flor. & Pom. 1868, p. 121 (L. *Wilsonii* hort.). This variety differs from all others in its habit and general appearance, as well as in its creeping stem, which resembles that of *L. Leichtlini*. It is quite possible that this may be a hybrid between *L. elegans* and some other species; but in the absence of any information on the subject, I prefer to leave it in this species for the present.

There is also a monstrous form, *L. elegans*, var. stenosema, Lem. Ill. Hort. t. 422, in which the filaments are changed into imperfect petals; but it has no beauty to recommend it.

I am indebted to Prof. Maximowicz, of St. Petersburg, for the following Notes on *L. elegans* as observed by him in Japan. "It is very near *L. decorum*, whose capsule it has, but seems to differ by the narrower wing of its seeds, broader leaves, (in the spontaneous, and often also in the cultivated plant) in the flower, which is red throughout, and not yellow at the base as in *L. decorum*, and in the less-opaque pubescence; but the principal difference is the solid bulb. I have this species wild, only from the north of Nippon, from two localities, where it seems to grow in clayey soil; but it is cultivated in many varieties throughout Japan. The wild plant is a spam high, the flower red, with dark spots. The cultivated ones are taller and very varied in colour."

"The Japanese distinguish also a spring and a summer form. The former, with narrower leaves and
a more open flower, they call 'Haru-sukashi-yuri,' and the latter, with broader leaves and narrower flowers, 'Natsume-sukashi-yuri.' I have not seen this second form.

"L. belliferum, L., with which L. elymus was often confounded, differs remarkably in its elongated capsule, which is deeply umbilicate at the apex, and sometimes (not always) by its axillary bulb.

"L. dahuricum, Gerd., is also found abundantly on the island of Yesso, about Hakodate, where it grows in grassy places, in crevices of rocks, and on borders of fir-woods. It is possible that some of the varieties of L. elymus have been bred in Japan between this species and L. dahuricum, in the same way that they have appeared in Europe between L. dahuricum and L. belliferum." There is reason to suppose that a Lily of this type is found in a wild state in the north of China; but having seen no dried or living indigenous specimens from that country, I cannot be sure to which species it belongs.

The cultivation of L. elymus and its varieties is easy: it requires nothing more than a good rich sandy soil, well drained, but not too shallow; and though it sometimes grows well in a peaty soil, it is not necessary for this as for some Lilies. In pots it also grows well if properly attended to, and produces seed which germinates quickly, and grows more rapidly than in the case of the Martagon, though great care must be taken of the young plants in their earlier stages.

My first Plate represents three varieties: on the left hand is L. elymus; in the centre, L. alatum; and on the right, L. atroroseum,—all of which were drawn from plants which flowered in my garden in 1878.

The second Plate represents the variety Alice Wilson on the right,—on the left the variety L. incomparsa, which I believe to be a hybrid between L. elymus and L. belliferum; on that account I have not mentioned it among the varieties of this species, though for garden-purposes it is one of the best forms which are commonly grown.
LILIAM CORDFOLUM.

THE HEARTLEAVED LILY.


Hemerocallis candicans, Thomson. Fl. Jap. 143; Gray's Prod. v. 484, t. 178. fig. 5.

Bulbus et L. gigantei similis sed minor, squamae paucis remisis. Caulis 3–5-petallus, sete atrae, rostis praefemum in ramos congoenios. folia primordialis curta, postuioe cordata, longe petiolo, adnata pilosula, venis anguste digitatis. Rosae 4–10-flora, in petalis, 9–14 poll. longa, petiolis brevioribus, 3–8 mm. longis, brevissimis ratis mediae et inferiores. Perianthum angustissimum foliobiflorum, 4–6 poll. longum, tubo et basi 3–4 mm. ad collum 12–15 mm. lata, seminae angustissima, segmenta e basi quadratis superioria 0–9 mm. lata ad basim angustissima. Stamina parumhis trinque breviores, anteras latis 4–6 mm. longis. Capsula et L. gigantei similis sed albae.


Kiaoking, Japan (A. DAVIS).

(F关) MACHULIS prope HAINAN (RAMAY).

Ningpo (FUBIN).

Bulbs of the same character as that of *L. giganteum*, but smaller and composed of fewer scales. Stems 3–5 feet high, not clothed with leaves to the base, but having a few large ones in a wheel about a foot from the ground, and smaller scattered ones towards the bottom of the inflorescence. Leaves shining glossy green, with a coppery tinge in a young state, all furnished with a broad flat petiole; blade sometimes nearly a foot long, prominently crenate, rounded or ovate, the veins tinged with purple and thoroughly reticulate. Rosae from 8 to 10 inches long, 3 to 5 or 6–8 in number; petals short and stout; leaves large, lanceolate, falling before the flowers expand. Perianth trunco-conical, 3 or 6 inches long, uisualty outside, stigmas with green towards the base; segments obtuse, obtusishaped, spreading obliquely in their upper half, narrowly gradually to the base, the three inner ones yellowish inside at the base, and spotted with purple, without any papillose or distinct groove. Stamens parallel, slightly deciduous, a little shorter than the perianth; every style, style parallel with the stamens, and a little longer; stigma capitate, obtusely three-lobed. Capsule oblong, 1–2 inches long, narrowed to the base and top, with 3 distinct keels, which (see Sieb. et Zucc.) give it a triangular appearance distinct from that of any other Lily.

This rare and curious plant here figured is very nearly allied to the Himalayan *L. giganteum*, forming with it a distinct section of the genus, named by ENGELBERCH Cordicerium. Mr. Baker in one time considered it only a subspecies of *L. giganteum*, but on further examination of living plants altered his opinion, and allowed its specific distinction in his revision of the genus. Professor Dechaure also, in his admirable and minute investigations on the growth of Lilies from seed (see 'Journal de la Société Centrale d'Agriculture de France,' 2nd ser. viii., 1874, pp. 504–588), has proved that this plant may be distinguished with certainty from *L. giganteum* in its earliest stage.

The form and position of the leaves, the shape of the flowers, stamens, and capsules are all very different from those of the Himalayan species; and though I shall not be surprised if intermediate forms be discovered in China, we have every reason for treating the plant as a distinct species. It was originally discovered in Japan by Thunberg, who at first called it a *Hemerocallis*, and has since been found by several other botanists, not only in Japan, but also, as I am inclined to believe, in China.

In Japan it grows, as I am informed by Mr. T. Hosoe, near Hakodadi, in the island of Yoo, and in other parts of the northern islands, but more rarely in the mountainous districts north of Yedo.

Prof. Maximowicz also found it in the same localities, and tells me that it grows most luxuriantly in deep, cool, shady woods, where the bulbs are buried nearly a foot deep in a light rich soil, and do not grow near the surface, as in the case of *L. giganteum*. It does not seem to be sogregious as some Lilies, and is scattered through the woods in small numbers.

In China it was found by the Rev. Davis on the Linhan Mountains, near Kiao-kung, and also by Mr. R. Fortune near the temple of Tien-tung, about 20 miles from Ningpo (see Fortune's 'Wanderings in China'). I am not certain that these plants are identical with the Japanese variety which is here figured. Indeed, from a drawing sent me by Lady Ramsay, which represents a plant found by Mr. Ramsay near Hankow, I am inclined to think that the Chinese plant differs considerably from the Japanese; but as the existing material is not sufficient.
to decide this certainty, I can only call the attention of residents and travellers in China to the fact, and hope that we shall soon be able to clear up the question.

It seems that this Lily was first introduced from China about the year 1833 by Mr. R. Fortune, who sent bulbs to Mr. Norreys, of Regent's Park, with whom they flowered. The plant, however, was soon lost sight of; and though it has been raised from seed by Herr Max Leichtlin in some quantity, and also imported from Japan in small numbers, I do not think it will ever become as popular a plant in our gardens as its Himalayan cousin, being apparently of a more delicate constitution and much inferior in beauty.

There was some correspondence on the subject of this Lily in the 'Gardener's Chronicle' for 1877, which tends to show that the variety first introduced by Mr. Fortune, and which, as I have said, probably came from China, was taller, more floriferous, and otherwise finer than those now in cultivation. There is also considerable difference in the arrangement of the leaves, which are not always arranged in a regular wheel, but are sometimes scattered.

As this plant produces its leaves very early in the spring, and they are much injured by frost, it is desirable to protect them with a mulch-light; and care must be taken that the beautiful bronzed foliage is not injured by sun and wind.

Though it has been successfully grown by Herr Leichtlin, M. Kellage, and others, I have never myself been fortunate enough to flower the plant, and am indebted to Sir Joseph Hooker for permission to figure one which flowered in the Royal Gardens at Kew in July 1877.

The capsule, which is the only one I have seen, was grown by Mr. Macintosh, of Oaklands Park, Weybridge, and though probably not fully developed, contained a few good seeds, and shows the peculiar shape very fairly.
Lilium Washingtonianum
LILIUM

WASHINGTONIANUM.

THE WASHINGTON LILY.


Bulbus oblongus, albous, subglobosus, stipites puruli lanceolati. Caulis 3-4-fasciatus, leves, glabris, viridis, hippos racemosis, infra racemosa nodosae. Folias in verticillis 6-12-fasciatis dispositas, vel superbas sparsas, chlenduloatas, patellatae, senecio glabra, 3-4 poll. longa, supra medium 8-12 lin. alta, aequalis, o modo ad basim secta angustata, semina lateriflora oblonga indistinctis. Racemus 4-5-fasciatus. 12-20-florus, expansus 8-9 poll. latus, pedicellis non eretundibus, fabricis 2-4 poll. longis, beneficio pariis, oblongoovato vel lanceolato. Perianthia saepe ovato subelliptico, abaxilium, 2-3 poll. longis, latioribus, rectis, levibus vel parvissimum latis, patellatis, purulis, liliaceis sparsis; segmentis oblanceolatis, 6 basi velis subtus superpositis 6-8-10 lin. alta, ad basim secta angustata, lato expanso frondaceo vel quadrato subpatulo foliato. Stamina perianthio quadrato two ittis, aestivis tibiis 3-4 lin. longis. Ovarium 8-9 lin. longum, stigma carinato subtriple brevius.

Hab. California, Oregon, in silvis montium 3500-6000 poll. alti. (Jeffrey, Bracke, Lords, Kellogg, dec.)

Bulbus oblongus, subglobosus, compungo longo, levibus, thebae æquales, dispositas in basis horizontalis axis. Stem 3-5 feet high, erect, tecto, glabro. Leaves in several distinct whorls, 3 to 4 inches or more apart, made up of 6 to 12 chlendulae spreading leaves, 3-6 inches long, by 1-12 lines broad, glabrescent, more or less waved at the edges, indistinctly veined, sometimes scattered on the upper part of the stem. Flowers 5 to 10, in a raceme reaching a foot long. Pedicels ascending, 2-6 inches long, with an indurate base at the base of each. Perianthum white or blue, more or less tinged with purple, and spotted on the throat, 2-4 inches deep, oblongoovatus, narrowed to the base, not papillate. Ovarium 8-9 lines long; style 1-3 inches, curved towards the tips, slightly exceeding the filaments; stamens yellow, 6-8 lines long. Capsule resembling that of L. Miltonia.

The Washington Lily was probably first brought to notice by Dr. Kellogg, of San Francisco, who exhibited, a dried specimen and figure of the plant at a meeting of the California Academy of Sciences in 1854. It had previously been found by Jeffrey, who sent specimens to the Kew Herbarium, gathered in 1853. The plant, however, was not described till 1863, when Dr. Kellogg gave it the name of Liliurn Washingtonianum; and it was again described by Prof. A. Wood under the same name in 1865.

Notwithstanding its beauty, this plant was not introduced into our gardens until recently, when Roger, the well-known botanical traveller, having been put on the scent by Herze Max Lewitzky, of Baden, sent him a consignment of bulbs from California, which arrived in 1869. Shortly after this it flowered in Mr. Kellogg's garden, and was figured by Dr. Baker, in the 'Gardenflora,' and also in Mr. Van Houtt's 'Hesper.' In 1872 and 1873 large quantities were collected by Mr. Roger, and sent to Europe, which have now found their way into the hands of most amateurs and nurseriesmen.

Though this plant has not hitherto quite realized in gardens the high expectations that were formed of its beauty, there is no doubt that the better varieties, when well established, will rank among the finest Lilies.

In considering the best means of attaining this object we must first describe the soil and climate of its native habitat.

Dr. Kellogg says in the 'Garden,' January 5, 1874—'It occurs in the Cuyamaca mountains in San Diego county (its most southern known limit at present), northeasterly along the western slope of the Sierra Nevada, between 2000 and 6000 feet elevation, in Oregon to the Columbia river, and on the coast-ranges north of San Francisco, especially in the eastern parts of Mendocino and Humboldt counties. In all the localities named it occurs either on ridges, or on lightly shaded slopes of ridges having a porous loose soil resting on a gravelly subsoil. At no time have I met with a plant of this species in a soil of which the drainage was not perfect, or in which when found on a slope, did not face to some point between east and south. The pole, loosely-scaled, weak bulb is found at a depth of 12 to 20 inches. The weight of the stem, the number of flowers and of flowers on a single stem, vary very much according to soil, position, and age of the bulb. Much has been said about the difficulty of cultivating this beautiful species. I willingly confess that I have also met with many reverses until I paid proper attention to its habits and habitats. If the bulb be planted at a depth of from 8 to 12 inches in a loose, somewhat gravelly
well, having perfect drainage, there is no difficulty in obtaining satisfactory results. Although there is positively no specific difference between the bulbs and plants collected either on the Sierras or on the coast-ranges, yet I found that bulbs from the coast-ranges would always bloom more readily in San Francisco (in cool houses) than those from the Sierras. The reason is obvious; but it would be interesting to know if the same holds good at other places.”

Two things are evident from this account, viz., that the bulbs must be kept out of reach of the frost, and also from being burnt by the sun. Though the heat of California both in summer and winter is (except at high elevations) much greater than that of England, yet the depth of the soil lying over the bulb would effectually prevent it from ever becoming either too hot or too cold. So great a depth would be unnecessary in Europe; but the drainage, whether in pots or in beds, must evidently be most carefully attended to, as the rainfall and dampness of our climate is greater than at San Francisco.

I am indebted to Mr. Hanson, of New York, who for many years has cultivated Lilies with great success, for the following notes on the species:—“L. Washingtonianum is found in almost every county in California and Oregon. The best variety that I have seen is from Jacksonville, Oregon, which had the bulbs and flowers very large, sometimes pure white, but generally spotted with purple, and occasionally with a yellow band. The soil in this part of the country is very rich, cool, and well-drained, which perhaps accounts for the luxuriance of the plant. I once received from Mr. Bolander, of San Francisco, three bulbs of L. Washingtonianum, the flowers of which were upright and trumpet-shaped, with the scent of a cowslip. It bore on one spike 21 flowers. There is a splendid variety, growing on the banks of Eel River, California, which has flowers of a light purple. All the varieties thrive in a deep, rich, loose soil and dry bottom, and are much averse to frost. They grow best in a frame filled with leaves and covered with a mat in winter. This way of protecting them will make the bulbs grow all the winter; but if the roots once rot, the bulbs will also perish. I think the plant is well worth all the trouble expended on it, though for common gardening it is worthless.”

The structure of the bulb in this species is very peculiar, though under cultivation it partly loses its characteristics. It is quite unlike the bulb of any other species, though that of L. Humboldtii resembles it in some points.

It consists of a horizontal rhizome, covered on both sides by a quantity of fleshy scales, of a dirty white color. These scales are about 2-3 inches long, by half an inch wide, pointed at the top, and convex outside. Their bases are attached to the rhizome in such a way that those on each side face each other, and are rather sloping than vertical. The growth of new scales, instead of taking place in the heart of the bulb, as usual, is at one end only; and the scales gradually decay at the other end, so that the flower-stem is thrown up from one end of the elongated mass. The roots proceed from the base of the bulb, gradually dying away as new ones are formed under the advancing rhizome. The growth of 4 or 5 years, however, is visible in a large bulb, which will measure 5 or 6 inches in length by 2 or 3 in depth, and has a thickness of about 2 inches.

The variety of this plant which has been described by Mr. Baker as var. purpureum differs from the plant which I have figured, in the nearly erect position of its flowers, in its smaller size, and in other respects from the typical variety. Prof. Samuel Watson, of Harvard, proposes to separate it specifically under the name of L. rubescens, and has doubtless some good reasons for doing so. As, however, I should be unable to say to which species some of the plants I have seen ought to be referred, I prefer to keep them together, and will give a separate illustration of this form in my last part.

The plant here figured flowered in the garden of Mrs. Bateman at South Kensington, in July, 1877; and for permission to figure it I am indebted to that lady, who cultivates Lilies in what would seem a most unsuitable situation, with as much ardor and success, as her husband Mr. J. Bateman, F.R.S., formerly showed in the cultivation of orchids.

The single flower represents the colour of the ordinary variety, which is much inferior in beauty to the one here figured.
LILIUM WALLICHIANUM.

WALCH'S LILY.


L. japonicum, D. Don, Prodr. Nesp. 57, non Thunb.

L. longiflorum, Wall. Tent. fl. Nep. 49, t. 23, non Thunb.

L. Beccari, Hamilton MSS.

Wallisiana varidens, 2-3 poll. fragosus, squamosis albus, acutis, margiibus auriculatis. Caulis 4-5-pedalis, viridis, strictius, levibus, glaber.


Hab. Regio subgentenatis Himalayae centralis et occidentalis a Kumaon ad Nepal, dec. 6000-8000 passum.

Stem erect, 4-8 feet high. Leaves numerous, often very crowded, lanceolate or linear-lanceolate, glabrous, acuminate, indistinctly veined. Flower terminal, drooping, solitary, or two or three from the same point, in which case the four or five upper leaves or bracts form an involucre. Perianthi-segments 8–10 inches long, broadly ovate, lanceolate, and spreading above, the lower part extended into a long claw. Flower fragrant, delicate, creamy white, tinted green or yellowish outside, especially on the tube. Stamens 2 inches shorter than the perianth; anthers 1-1/2 inch long; pollen yellow. Sepals longer than stamens; stigmas large, capitate, with three gibbous reflexed lobes.

This fine Lily was originally discovered by Buchanan Hamilton in Nepal in 1829, and was sent to Europe under the native name of Beccari. Wallach next found it on Shoepore, a high mountain near Kathmandu, in 1839. He published a figure and description of it under the name of L. longiflorum in the 'Tentamen Florae Nepalcensis,' from which Schottel was led to consider it a distinct species. It was introduced in a living state by Major Mackenzie in 1840, and was figured in the 'Botanical Magazine' and Lindley and Paxton's 'Flower Garden,' in the following year.

Dr. Lindley says:—'We received it last year from Mr. D. Moodie, the official curator of the Botanic Garden at Glasgow, to which it had been sent with many other plants from Almora by Major Mackenzie. The bulbs arrived in April; and on the 10th August the plants were 4 feet high.'

The root figured in the 'Botanical Magazine' is so very unlike the bulb of this Lily, that I supposed it to have been inserted by mistake; but Dr. Wallach, from whose plate in the 'Tentamen' the root was copied, says:—'The base of the stem I have repeatedly found horizontal, creeping, and sealy, like that of a fern, without any remainder of a bulb, but marked with a number of vestiges of old stems.'

This peculiarity, which I can hardly doubt when we have it on such good authority as that of Dr. Wallach, has, as far as I know, not been observed in any other species of Lily, or by any other writer. The bulbs which I have examined are quite of the same type as those of other oriental Lilies; they may, however, be easily distinguished from any other by the scarious edges of the scales, which are closely pressed together, and pointed at the top.

The best account we have of the native country of this Lily is given in a letter from a correspondent of Mr. Barn's, printed in 'Garden' for January 21, 1874.

Writing from Musori he says:—'L. Wallachianum flowers in August or September, more usually the latter. It is a hardy plant, and here defies both heat and cold. I find it growing at an elevation of 5300 feet on the open grassy hills, on a slope of 45°, not in the shelter of the forest, in a soil full of limonite pebbles, the matrix composed of lime, clay, and vegetable mould. On account of the steep slope of the hillside it is thoroughly free from surplus water; the temperature of the summer sun being from 100° to 130°. From June to the end of September (which is our rainy season) it grows in a perfect deluge, and is often submerged in mist for days together. From September to December it gradually dies down in a fine warm temperature by day, with rare frost at night in November. Little rain falls during these months. Sometimes there is but little snow in winter, with hard frost; at other times the snow lies 2 feet deep; but this is unusual. The bulbs lie at from 6 to 2 inches depth, and are uninjured. The plant seldom or never produces seed, but is propagated by suckers or by bulbils from some part of a long root, so that the flowering plants are surrounded by numerous young ones of various ages.'
Another correspondent writes:—"*L. Wallchienus* is certainly a magnificent Lily. I have seen it in the Himalayas 8 feet high."

From these accounts it is evident that, whatever may be the powers of enduring cold of this Lily, a very considerable degree of summer heat and moisture is necessary for it; and for this reason I do not think it will ever prove an easy plant to grow in Europe.

Just at the time when we have most heat in England we usually have least rain; and the consequence is that *L. Wallchienus* grows so late and so weakly that it is cut down by frost just as it is beginning to show a little vigour. Mr. Nixon, however, of Hall, has succeeded in keeping it for some years, and says, in the Notes on Lilies by Dr. Wallace:—"I am not a little surprised to see the allusion made to the native habitat of *L. Wallchienus*. On this matter I am in a position to give an opinion, as it has been planted out in these gardens for sixteen years, and flowers every year. It has never had any protection beyond a covering of about 6 inches of light peaty soil. Although cultivated for so long it is very shy of increase; and I once very nearly lost it through an attempt to divide what seemed a perfectly formed offset."

It is the opinion of Mr. Lightfoot, that there are other and much finer forms of *L. Wallchienus* than the one here figured; and it is described by Wallace as having usually two or three flowers on a stem; but, as far as I am aware, none of these now exist in Europe.

I am indebted to Dr. Wallace for the plant here figured, which flowered in July 1876 at Colchester. It agreed almost exactly with the figure in the 'Botanical Magazine' in the slightly irregular position of the lower petals. I believe it was grown in a greenhouse, and attained nearly 6 feet height.

A large number of bulbs were imported three or four years ago by Mr. Barr, some of which have flowered in England, but I have never seen or heard of any finer than the plant figured; and the majority of them have, I believe, like so many other fine Lilies, perished after a year or two.
LILY.
LILUM AVENACEUM.
FISCHER'S LILY.

L._mammosum_, A. Mekus, vol. v. fol. 78.


Bulb small, white, composed of narrow, pointed, loosely attached, jointed scales, the upper part of which resemble in shape and size a grain of oat, from which resemblance the plant takes its name. Sown 1-2 feet high, slender, loose, glabrous. Leaves usually in a single whorl of 6-9, but sometimes in a double whorl, or scattered, 2-4 inches long, 6-12 feet wide, narrowed upwards to a long acute point, thin in texture, and glabrous or faintly downy beneath, with 1-3 indistinct nerves. Flowers 1-2 or more, in an irregular corymb, or umbel-like, on slender branched pedicels, drooping at the apex. Perianth 18-18 lines long, scarlet or reddish orange, the divisions lanceolate, blunt, and faintly pubescent at the tip, 4-5 lines broad, relieved for two thirds of their length, spotted on the face with dark purple or black, not papillose or pubescent on the groove. Filaments 0-12 lines long; anthers small. Ovary 4-5 lines long, shorter than the style. Capsule oblong, narrowed at the base.

THOUGH _Lilium avenaceum_ appears to be a very common plant on the coasts and islands of North-eastern Asia, our knowledge of its peculiarities is still somewhat deficient, and it was not until 1877 that I was able to procure a living plant of it for figuring. It was apparently discovered long ago by Pallas, and afterwards gathered in Kamchatka by Dr. Ritter, Escizinolcz, and other travellers, but was not recognized or described as a distinct species until Maximowicz brought it to Russia in 1864, and described it from a plant which flowered in the Botanic Garden of St. Petersburg.

This Lily has been somewhat confused with another species (_L. Hassanii_), which I have already figured; but, without speaking of the great difference in the size, habit, and appearance of the plant, the structure of the bulb is so very different from that of _L. Hassanii_, or of any other Lily, except _L. neauicolaides_, that I have no hesitation in separating them. It seems to resemble _L. tenuifolium_ much more closely than _L. Hassanii_; and unless it grows much more luxuriantly in its native country than it has done in cultivation, I am at a loss to understand how it can ever have been confused with the latter.

Prof. Maximowicz tells me it is common in Kamchatka, and is also found in the Kurile Islands, South Sachalin, South Yezo, North and Central Nippon, growing in mountain-slopes and grassy hills in good black soil. It is commonly used as an article of food by the semi-savage inhabitants of North-east Asia.

I am indebted to Mr. Fitch, of Vermont, for three bulbs of this Lily, which he cultivates with more success in the climate of the United States than we can hope to do here. One of these, which I sent to Henry Max Houghton, produced two flowers in June 1877. From this plant, and one which was exhibited by Mr. Wilson at a meeting of the Royal Horticultural Society about the same time, my Plate was taken, the capsule, which I have not seen, being copied from the plate in the 'Gartenflora' for 1860. The delicate scales of the bulb of this Lily, which, from their resemblance to the grain of the oat, have given it the name of _avenaceum_, seem to be very loosely attached, and, I am inclined to think, do not form offsets.

From what I can learn, I believe that a very moist cool soil and considerable summer heat are indispensable for the growth of this plant, which is not likely to become naturalized in our gardens.
LILium MEDEOLOIDIES.

GRAT'S JAPAN LILY.


Caulis 1-3-pedicellatus, ramosus, teretis, glabros, flammaeos. Folia in verticillis unius lacte disposita, alioventrale teres, glabras, virides, 1-6 poll. longae, supra mediam 9-15 mm. lata, venis intempestatis 3-4 distinctis, spuria reducunt super verticillum spinam. Flores solitarii vel 2-3 umbellati, pedunculis brevisimis spicis erectis. Petalisum 12-15 mm. longum, eretutum, specie inextricabilis, murumato-ciliatus, petasis parce viridis intus decrescentem, segmentis lancifolioribus et laciniis leviter foliatis spicis, culbis, ramentosis, pubescentibus; nothum 3-4 mm. lato, basi leviter synchilatibus, flore cultura obscurum. Flavescens peristerio duplo brevior, antheris 4-6 mm. longis. Ovarium clarissimum, 4 lilia longum, style erecto, pado brevissimo.


Bulb probably resembling that of *L. acuminatum*. Seta 1-2 poll. high, slender, tenue, gibbosus. Leaves either arranged in a single wheel of 7-11, or rarely in two wheels with a few scattered on the upper part of the stem, oblongato-lanceolati, acute, 4-8 inches long, 0-5-10 lines wide, 3-4-40 poll. quid glabros. Flores 1-3 nunc, in an uncal, the slender pedunculus 3-4 inches long, nudo or bracteatis. Petalium 12-15 mm. longum, erectum, the distinct divisions only near the tip, lanceolati, not narrowed into a distinct claw, 2-4-8 lines broad, reddish yellow, with a few purple spots, not papillosi nor pubescenti. Filamenta 9-11 mm. longi; anthera small; style longer than the calyx evertus.

Of this Lilium we know less than of almost any other Asiatic species, and what we do know is not very certain.

From its appearance in a dried state I should suppose that the plant is extremely like *L. acuminatum* in bulk, habit, and leaves, though it differs remarkably in the erect position of the flowers. On this account it has been classed by Mr. Baker among the *Isolariinae* group; but I have figured it on the same Plate as *L. acuminatum* on account of its inhabiting the same islands, and being, as I think, more nearly allied to that plant than to any other Lilium.

It was first made known to science by Prof. A. Gray, who described it from specimens collected by the United-States North-Pacific exploring expedition near Hakodate, in Japan.

It must, however, be somewhat rare and local, as neither Maximowicz nor any other travellers have noticed it in Japan, or they have confounded it with other species.

Mr. Hooker tells me in a letter, "*L. acuminatum* is found growing in Posiyma, whence I have received it. Whether *L. medeoloides* is distinct from it is a matter for inquiry, as the two appear to be sometimes confounded. The native name is "Kurosawa Tsuru," signifying the Wheel-lily. The application of the name is probably to the marked position of the leaves in wheels." I am not aware that this plant has yet been cultivated in Europe with success.

A small number of bulbs have been recently imported under this name, one of which is figured in the Plate, and which seem exactly similar to those of *L. acuminatum*. I cannot be sure, however, of their authenticity; but as I am unable to defer any longer the publication of this Plate, I must leave the matter to the investigation of travellers and residents in Japan.

The plant was drawn by Mr. Forrester from the excellent dried specimens in the Kew herbarium, which were collected by Mr. Olleham in 1862 in the Herschel Islands, part of the Cocos archipelago. It is much to be wished that the extremely interesting form and fauna of these islands and the Cocos may not remain much longer almost entirely unknown.
LILIUM CONCOLOR.

SALISBURY'S LILY.


Var. a. TYPICA, Regel, et spath.

Bulbis solitariis; foliis oblongo-lanceolatis, oblongi 7-nerviis; sepalis oblongae conciosae, immaneulis, apices paulli recurviis.

Hab. Japana!

Var. & Tschersich, Fedch. & Lillium Ind. Sem. Petr. 1840, p. 36; Gartn. Die, t. 281 (1869); Rev. Hort. 1662, p. 131, non Linn. v. p. 132; Fern. Cat. 1831, p. 1124.


Bulbis solitariis; foliis lanceolatis; sepalis conciosae, plus minusve punctatae, apices recurvi.

Hab. Dayiensis et Mandshur, China borealis (MAXIMOVIC).


Bulbis compitiosa; foliis lineariis; sancta polonia, purpurae-aureoacutae; pedunculo purpureo-

Hab. Japonia, culta.


Var. c. Linn. var. in Herb. Petr.; Gartn. Die, t. 885 (1876). (An antis distincta.)

Bulbis compitiosis (Sic RZgetic); foliis lanceolato-lanceolatis, 5-nerviis; sepalis obtusis, spinae submarginalis, lateis, latissimae, marginalis.

Bulbis compitiosis seu unico, ab uno an inch in diameter. Stem 1-3 feet high, excis, robusta, in some cases (as in var. oblonga) palieaescent, purplish, and occasionally bearing small bulbs in the axils. Leaves 20-30, scattered, spreading, lanceolate, 3-4 inches long, 4-6 lines broad, narrowed to both ends, slightly downy below, 3-5-nerved. Flowers 1-5, ovoidal. Petals 1-2 inches long. Peduncles 1-2 inches deep, bright scarlet or yellow, sometimes more or less profusely spotted with black, 6-8 lines broad, spreading, scarcely stipitate at the base, not purpurea, the groove slightly paliescent. Filaments 12-15 lines long, rather 2-4 lines; pollen red. Ovary 8-9 lines long; style half as long. Capsule obovoid, oblong, about an inch long; seeds very narrowly winged.

The plant whose intricate synonymy I have endeavoured, with the help of Dr. Regel, to unravel, is to me a very puzzling one, and another proof, if such were needed, of the extreme difficulty of deciding on the classification of Lilies.

Here we have several varieties of one plant differing considerably in habit, colour, and size, but not more than is usual in the genus, and having flowers all of very similar appearance. But when we come to examine the bulbs, we find two very distinct types; and, were it not for the fact that, as far as my present knowledge extends, one of these types has not been found in a wild state, I should at once decide that it had as good a claim to specific distinction as L. columbianum has from L. concolor.

The first type, to which the first two varieties belong, has a small, solid, round bulb, of ordinary shape, such as is shown on the left-hand side of the Plate. The second, however, produces what I may term a nest of bulbs, consisting of four or five of equal size joined together at their base, and, if separated, each capable of producing a similar nest during a year's growth.
No case at all resembling this is known to me among Lilies; and I can only say that I shall be much surprised if this curious habit turns out to be the result of culture.

My own idea is that in some of the unexplored regions of North-east Asia, perhaps the Coree, a plant exists possessing this peculiarity, and this plant, having been introduced into cultivation, has developed in China the variety called *sibirica*, and in Japan the varieties (differing only in colour) which are known as *curvata* and *patentia*.

If this is not so, how is it that the bulbs of *pulchellum*, of which I believe *concolor* is only a garden form, do not in cultivation show any tendency to form resto and indeed, in this country more frequently perish than reproduce themselves at all?

The plant appears to have been introduced in 1864 by the Right Hon. Charles Garville, from China; and so at that time we had little or no communication with North and Central China, the bulbs were probably from some Canton garden. The variety *sibirica* was brought by Mr. Fortune from Shanghai, where he found it in nurseries, but not in a wild state; and I have received, through the kindness of the late Mr. Svinhvin, a box of bulbs of this variety directly from Shanghai.

The Siberian variety *pulchellum*, which is, in the opinion of Pacc. Maximowicz, the wild origin of *L. concolor*, is abundant in North China, near Pekin, in Chinese Manchuria, in Darien, at the river Argun, on the Upper and Lower Amur, on the Sungari and Ussuri rivers, and on the coast adjoining the northern frontier of Coree. It has not, as far as I can learn, been found wild anywhere in Japan, and the small number of bulbs which is exported from that country shows that it is not even in gardens so abundant as some species.

In cultivation this Lily is not likely ever to become well established, though I am unable to assign any cause for the way in which it sometimes dies away. It is certainly hardy enough to bear any degree of cold to which it may be exposed in this country, but seems to require either more heat in summer or some other condition which it does not get in England. Sometimes it will grow and flower well for a year or two and then die; and I am inclined to think that, like *L. trilobiflorum* and others, it is not a true perennial, but naturally perishes after seeding freely.

From a horticultural point of view there is not much to choose between the different varieties. The Shanghai form is perhaps the largest and most floriferous; but even that is with me a very uncertain plant; and the Japanese *curvata* I have never been able to keep over a year or two, though in Holland and Belgium it sometimes grows freely. According to Mr. Lemaire’s experience, the seeds of the different varieties of this species germinate quickly (in from four to six weeks), and produce flowering bulbs in the third year.

My Plate was drawn from a fine plant of the var. *pulchellum*, received from Russia, which flowered at Kew in July 1876. Fig. 2 is a plant of the variety *sibirica*, from Shanghai, showing the phloe stems and clustered bulbs. Fig. 3 is a flower of the Japanese *curvata* and a bulb of the same, from my own garden.
LILium oxypetalum.

ROYLE’S LILY.


L. triplex, Klotsch, Reise Wildt. 53. t. 93.

1 L. ensata, Klotsch, Reise Wildt. 53.


Bulbs elongated, with few narrow, pointed, white scales, about 1½ inch long. Stems slender, filiform, 1½ feet high. Leaves 15–30, lanceolato-ovata, scattered, alternato or somewhat crowded near the top. Flowers usually solitary, sometimes 2 or 3 in number; the segments spreading from the base and basally at all reduced, about 1½ inch long by 8 or 9 lines broad, purplish in colour, spotted at the base inside with darker. Stamina a third shorter than the perianth; authors slender. Ovary oblong, 3–6 lines long; style somewhat shorter. Capsule 9–12 lines long, obtusely angulata.

This pretty little Lily was apparently first discovered by Dr. ROYLS at Tawna, in Kumaun, in the North-west Himalaya. It was also found by General STECHN at Pindari, in Kumaon, at an elevation of 12900 feet, and by other travellers, but does not appear to be a common plant, as, notwithstanding all the efforts I have made to procure living bulbs, I have been unsuccessful.

It was introduced to England by Messrs. STECHT and WINTERSHOTT in 1852, and flowered in June 1853 at Kew Gardens. The drawing which was then made by Mr. Fitch, and published in the ‘Botanical Magazine,’ plate 6721, is here reproduced.

Lilium triplex of Klotzsch, which was gathered by Dr. HOFFMANNSTEIN, who accompanied Prince WALDSTEIN of Prussia during his Himalayan travels, appears to be the same plant. The type specimens (which I have examined in the Berlin Herbarium) only differ from my figure in having the upper leaves more crowded, and occasionally in the presence of 2 or 3 flowers.

1 L. ensata of Klotzsch (which I have seen in the same herbarium) has the appearance of a stunted specimen of the same species; but the specimens are not sufficient to make this certain.

The habit and size of this plant, which is the smallest Lily yet known, give it more the appearance of a Fritillaria, but its peculiar long scaly bulbs shows at once that its affinity is rather with the Lilies.
LILIJUM NEPALENSI.

THE NEPALESE LILY.


L. ochroleucon. Wall. in Ld. Linlsey.


Hab. Regio temperata Himalae centralis.

Bulbs not known with certainty; but those which I have received as L. nepalensis resemble small bulbs of L. Wall. & Ass. Bot. It is 2-3 feet high, globifer, naked below. Leaves about 20 or more, oval-lanceolate, alternate or scattered, 2-3 inches long, 9-12 inches broad, 5-7-nerved. Flowers solitary or sometimes 2 or 3, drooping, 1-2 inches long, yellowish, more or less marked with veins inside. Stamina a little shorter than the petals. Anthers 6 lines long, pollen yellow. Ovary and style a little longer than stigma. Capsule ovate, 2 inches long, eternally angulata.

Found by Dr. Wall. & Ass. Bot. in the mountains of Gossain-don, near Kathmandu, Nepal.

The only certain knowledge we have of this lily is derived from the description and plate in Wall. & Ass. Bot. ’Planta Asiatica Rubra‘ i.e. for though specimens exist in herbaria from other sources, I cannot refer them with certainty to Wall. & Ass. Bot. plant, and I have been unable to procure any further information about it from India. It appears to be confined to the mountains of Nepal, at an elevation of 1000-2000 feet, and, judging from the plate, is a distinct and well-marked species, differing by the drooping position of the flowers from any of the nearly allied plants of the Fulvum group. It appears to have been introduced to England in 1853, the following note from the ‘Gardener’s Chronicle’ for that year, p. 301, being the only notice I can find of its having flowered in Europe:

"A small, single-flowered bulb, with alternate lanceolate leaves. Flowers Gould, with revolute, smooth segments as long as the tube. Stamine shorter than the flower, with deep-orange-coloured pollen. According to Dr. Wall. & Ass. Bot. the flowers are dull yellow; in the specimen before us they are greenish, much speckled with purple inside. It is from a very weak bulb, presented to the Horticultural Society by the East-India Company, and which opened on the 10th of July, that this note has been made. The Indian drawings represent the flower to be 8 inches long, which corresponds with Dr. Wall. & Ass. Bot.’s account and with our wild specimens. It never seems to grow more than 2 to 3 feet high, and has no shade worth mentioning."

A few bulbs, under the name of L. nepalensis, were introduced two years ago by Mr. Baker; and one of these is still alive in my greenhouse. As, however, it has not yet flowered, I am unable to state of its identity, and have not figured it.

I am inclined to think that Mr. Baker has drawn up his notes on this species in the ‘Gardener’s Chronicle’ with some other plant in view; but as I believe that the specimen in Wall. & Ass. Bot. herbarium are the only ones which can be depended on, they have been copied by Mr. Pritch for this work.
LILUUM MARITIMUM.

THE COAST-LILY.


Bulbus globosus, siccus crenatus, umb; modo rhizomatosus, 1-1½ poll. diam., squama alpestris. Calyx 1½-3-petalis, strictus, erectus, fide oblongolobus, glabris, tinctus, 1-3 poll. longis; supra medium 5-6 lin. lat.; septo coniuxes alterius, rana verticalis, inferiores ecretis, superiores angulis segrapatis, squama minuta, superalis 3-6 lin. longis. Flores 1-6, laxe escentibus, pediculis elongatis. Perianthium oblongum, sub-acutum, 15-18 Ex. longum; segmenta lenticellata, medio 5-6 lin. lat.; staminis supra medium reflexae; gentilias perianthio tetrata breviores. Stamina 9-10 lin. longa, antheris 3 lin. longis.

Red. Nayo Swamp, Mendocino Co., California. (Kellogg, Bolander.)

Stem 1½-3 foot high. Leaves scattered thinly on the upper part of the stem, but crowded below, occasionally whorled, 1-3 inches long below, diminishing to size towards the top, 3-nerved, glabrous. Petals 2-4 inches long, recurved. Flowers多名, reddish orange, with purplish spots; the segments slightly revolute. Style short, straight. Capsule and bulb unknown to me, but said to resemble those of L. columbianum.

This Lily has been recently described by Dr. Kellogg, of San Francisco; and though it has not yet been imported to a living state to Europe, I am enabled, through the kindness of Mr. Sargent, of Harvard University, to give a figure of it from a dried specimen, which was selected as being fairly typical of the plant, and which is now in the Royal Herbarium, Kew.

Mr. Baker, to whom I am indebted for the description given above, thinks (and I am entirely of the same opinion) that there is, as far as we know at present, no good character by which the plant can be distinguished from L. columbianum; but as we have not yet been able to compare the plants in a living state, and Dr. Kellogg must have had good opportunities of doing so, I should not be right in refusing to recognize it as a distinct species.

I have received from Mr. Roez, the well-known botanical collector, an account of a Lily which he found on the same coast, between the Elk and American rivers, about 200 miles north of San Francisco, and which, I think, must be the same. Mr. Roez sent home bulbs of it under the name of L. Plum Hardtdey; but I am not aware that any of them survived or have flowered in Europe (though I received a drawing of it under that name from Messrs. Sanderson and Co., of St. Albans). He described it as being a dwarf Lily, very distinct in habit from any other, and having a small, orange-red-spotted, camouflage flower. The bulbs resembled those of L. columbianum, of which the plant is very possibly a local variety.

The following note on this Lily by Dr. Kellogg was published in ‘The Garden, July 17, 1875.—“This is a very dwarf maritime Lily, recently described, although for five or six years considered doubtfully distinct by Mr. Bloomer and myself; his opinion I find recorded on the label. A year ago I visited its native habitat, devoted particular attention to its special characteristics, and collected many bulbs for distribution to Mr. Bloomer and other friends for study, culture, and comparison. It is now in bloom at Mr. Bloomer’s; and I think it well worthy of a distinctive name. It has not the creeping, cupulate, or zigzag mass of bulbs like L. perenne or L. partitum, and may be worth a distinct notice hereafter.”
LILIJUM PARRYI.

PARRY'S LILY.


D逾. San Bernardino.

Balls apparently intermediate in form between those of L. Washingtonianum and L. pendulina, subrubrumatans, composed of numerous crossed scales, thin and pointed, about an inch long, the upper points broadly lanceolate. Stem slender, glabrous, 2-5 feet high. Leaves usually scattered, the lower ones occasionally whorled, linear-subulate, 4-6 inches long, about 6 lines broad, mostly acuminate. Flowers 2-16, in a congested cluster, horizontal, pale yellow, spotted and minutely dotted with purple; segments 3-4 inches long, 6-6 lines broad, with long narrow claws, slightly spreading from the base, recurved at the point; stems and style equal in length, about half an inch shorter than the perianth; anthers 3 lines long. Capsule narrow, oblong-acute, 2 inches long by 6 lines wide.

I am indebted to Mr. C. S. Sargent and to Prof. Sherlock Watson, of Harvard University, Cambridge, U. S. A., for the description of this Lily.

It was described by Prof. Watson from specimens collected by Dr. Parry early in July 1876 in a marsh in San Gorgonio Pass, San Bernardino County, South California.

It appears to belong to the type of L. Washingtonianum more than to any other Lily; though I am not sure whether either of these plants can properly be included with L. longiflorus &c. in the Edistria section.

The balls, as far as I can judge from the excellent drawing, seem to be of a type intermediate between L. Washingtonianum and L. pendulina, though the affinity of the plant is certainly with the former species. It may be that its balls, from growing in a marshy situation, have become somewhat modified in form.

I am not aware that any variety of L. Washingtonianum has been found so far south as the San-Bernardino Mountains, which lie in about lat. 34° N., on the borders of the desert country which lies between Arizona and the sea.

I am indebted to Mr. Duncan Petran for the following extract from Dr. Parry's account of the plant.

"In one of my last botanical excursions in the vicinity of San Bernadino, in July 1875, I accepted an oft-repeated invitation to visit the intelligent brothers J. F. and E. M. Rice in their mountain retreat near San-Gorgonio Pass. Leaving the broad and picturesque basin of the Santa-Ana valley near the emergence of the stream from the rugged mountain-wall of the San-Bernardino range, our route, after crossing Mill Creek, hugged the foxtails bordering the Upper-Yuma valley; thence, by a more rapid ascent in a nearly direct easterly course, we reached an elevated bench scattered with pine and oak groves, overlooking the broad sweep of the San-Gorgonio Pass, now traversed by the eastern extension of the South-Pacific Railroad. In one of these mountain passes the Mierras have located a potato-ranch, the elevation of over 4000 feet giving a sufficiently cool climate, while the adjoining mountain-slopes afford an extensive summer pasture-land long after the herbage of the lowlands has dried up.

"In scattered groves of Pinea Coulteri the ground is strewn with the massive cones of this peculiar species, its dense scales armed with formidable hooked spines. Many of the cones were fully 6 inches in diameter, with a length of 9 inches.

"The few perennial watercourses here met with are mostly confined within deep and inaccessible ravines; but more frequently scanty springs come out from beneath deep layers of porous strata and spread out into boggy and moist meadows, generally choked up with rank Willow and Alder growths, and occasionally expand into small meadows of coarse grass and sedges.
"On all the steep gravelly slopes adjoining there was the usual display of Californian evergreen shrubbery, including the hothouse-like Adenostoma (which, under the name of 'chimisal,' is largely used for fuel), the Holly-leaved Cherry (Prunus ilicifolia) exuding a strong odour of bitter almonds, the Heteromeles arbutifolia with glossy varnished leaves, and a prevalent form of 'California Lilac' (Ceanothus crassifolius) with thick leathery foliage. The dull green hue which everywhere characterizes the monochromatic growth, is at this time of year partly relieved by brilliant scarlet festoons of Pentstemon auriculatus trailing over adjoining bushes, or the less showy blossoms of Pentstemon terrae-novae.

"But what soon attracted more exclusive attention was a conspicuous yellow Lily growing abundantly on the bony ground adjoining Messrs. Ruge's house, and sharing with the potato-patch the care and attention of the undisputed possessors of the soil. Though not so showy as some other members of the Lily family in this region, there is a grace displayed in its large drooping flowers surrounding a slender stem beset with narrow scattered leaves, which are occasionally crowded at the base into a distinct whorl."

The Lily in question has not yet been introduced into Europe, but is in cultivation in the Botanic Garden of Harvard University.

The careful drawing from which Mr. Pinon has lithographed the Plate was made by Mr. Otto Greiner, of Rock-Iland Arsenal, Illinois, from dried specimens selected by Dr. Parry, and was pronounced by that gentleman to be a true and characteristic likeness of the living plant.
LILIUM PARDAEINUM.

THE CALIFORNIAN LILY.

In my previous account of this Lily which accompanied the Plate of the species called *californicum*, I said that the varieties were numerous, but, as far as I could judge from the examination of a very large number, many of which have flowered annually for four seasons in my garden, I believed them all to be forms of this species. The synonymy of the plant, however, is very confused; and though I have endeavored to clear it up as much as possible, I am not sure whether some of the synonyms quoted under this species may not belong to *L. Humboldtii*.

Dr. Sereno Watson, of Harvard University, who has recently revised the flora of the Pacific States, speaks as follows, in a letter dated April 29, 1878:—"I suspect that there is some confusion with regard to *L. pardalinum* and its varieties. My specimens are more scanty than I could wish; but I have specimens from Kellogg himself, both of *L. pardalinum* and his var. *augustifolium*. His *pardalinum* is from Alameda County, and is the stout large-flowered form with many-leaved verticils. The variety has narrower scattered leaves, and is like Hartweg's no. 2003 (*L. candidum*, var. *Hartwegii*, Baker), which I suppose must also be *L. leucos*, Regel, by some blunder said to come from Utah, and in my opinion a good variety as compared with what I take to be the typical form. I do not know what your *californicum* is, as I have not access to Lindley's plate. Hartweg's specimen, which Baker refers to it (1804 doubtless), he mentions again in connexion with *L. candidum*, var. *pokermii*, Torrey, under *L. Humboldtii*. Is it not possible that this *L. californicum* covers forms of *L. Humboldtii* (which ranges as far north as Yakut Co. at least), as well as perhaps the typical *pardalinum*?"

In a later letter dated May 6th, and written after seeing the Plate in the fourth part of this work, Poor Watson says:—"It seems that my conjectures respecting *L. pardalinum* were, at least in part, correct. Your figure represents exactly what I received from Dr. Kellogg as the typical form; so that there need be, I think, nothing more said of a var. *californicum*."

After taking into consideration all the facts I have been able to gather respecting this species, I think the best arrangement for its varieties will be as follows:—

1. *L. pardalinum*, Kell., =var. *californicum*, Lindl., =*L. Robii* var. hort., figured in part 4 of this work, the Plate lettered incorrectly as *Lilium candidum*.

This, which I take to be the typical form, is easily distinguished from the rest by the size and colour of its flowers, which approach those of *L. Humboldtii* in dimensions and brilliancy. This form never, in my experience, bears more than five flowers, usually only two or three. The petals usually spring from one point on the stem, as shown in the figure, and do not form a raceme, as usual in the other varieties. This form cannot come from seed in my own garden; but I cannot say whether it always does so. I believe it was first introduced from California to this country by Mr. Robinson of the "Garden," who has done more to make Lilies and other hardy plants popular than any other writer.

Hab. Alameda Co., California.


This form, which is perhaps the commonest in gardens, is distinguished by numerous flowers of moderate size, lanceolate leaves about 6 inches long by one broad, usually in whorls of eight to twelve; but the whorls are often broken and the leaves scattered.


A form near the last, but with narrower, more pointed leaves, twelve to fifteen in a whorl, the perianth-divisions wider, longer, and more open than in the last. It was raised from seed in Mr. Warb's nursery at Tottenham; but a plant from Sonoma Co., Oregon, which I received from Mr. Hanson, was exactly similar.


This form resembles the last two more than the first, but is distinguished by the whorls of leaves being almost invariably double. Each whorl contains about 12-24 leaves in two series. The plant is, in England, from
fifteen to twenty days later in flower than the others. It has been in cultivation many years in the well-known garden of the Rev. H. Ellacombe, at Bitton, under the name of *L. Michauxi*—but has nothing to do with *L. cordiniwm*, of which *L. Michauxi* is a synonym. It was, I believe, introduced many years ago by Harrow to the Royal Horticultural Society's garden.


This form, which is, in gardens, usually called *pulchellum*, but is not the *pulchellum* of Tournay, is distinguished by its short, blunt, spatulate leaves, which are constantly of a paler colour than those of the other varieties. It is very floriferous, producing from twenty to thirty or more flowers on a stem from 5 to 8 feet high; but the flowers are individually somewhat smaller and paler than in the other varieties. I first received it in 1873 from Messrs. Backhouse, of York; and I believe it was first introduced, together with other varieties of the same plant, by Mr. B. Roesel. The first, second, and fifth of these forms certainly appear to be distinct and constant varieties; and the third and fourth have been so far four seasons in my garden; but I should not be surprised to find that their distinctive characters disappeared under changed conditions; and, perhaps, even now they could not be exactly identified with plants in a state of nature.

The habitat of this plant is the coast-range of California and Oregon, from about 1000 to 5000 feet elevation, where it grows in marly valleys and wet places near springs. It is found growing in great abundance in certain localities, and frequently attains an elevation of 7 or 8 feet. I am not aware that any of the forms of this Lily have been found in the Rocky Mountains, or in Southern California. The habitat given for *L. Roeselii*, viz., Utah, is, I think, very doubtful; and Mr. Roesel himself was unable to remember having found any plant of this nature in Utah.

The cultivation of all these forms is so easy, their constitution so good, and their increase so rapid, that I can confidently recommend them to all. Unlike so many Lilies, which year by year get weaker and fewer, and soon die, notwithstanding all the pains which has been taken to provide them with congenial quarters, this species is a really good garden plant, requiring only tolerably deep moist soil and protection from wind to develop its full beauty.

The bulbs, when established, produce annually from three to five flowering growths from each old one, soon causing a crowd of new stems to spring up, and a great abundance of flowers to appear. The seed also, which is produced in favourable seasons, grows much more quickly and easily than is the case with many Lilies, and produces flowering plants in about four years. I have found that it is better to divide the masses of bulbs formed by the varieties of this Lily about once in three years, as they crowd each other so much by their rapid increase that the stems become weak from want of room.

The plant from which my figure was drawnflowered in my garden in July 1875.